

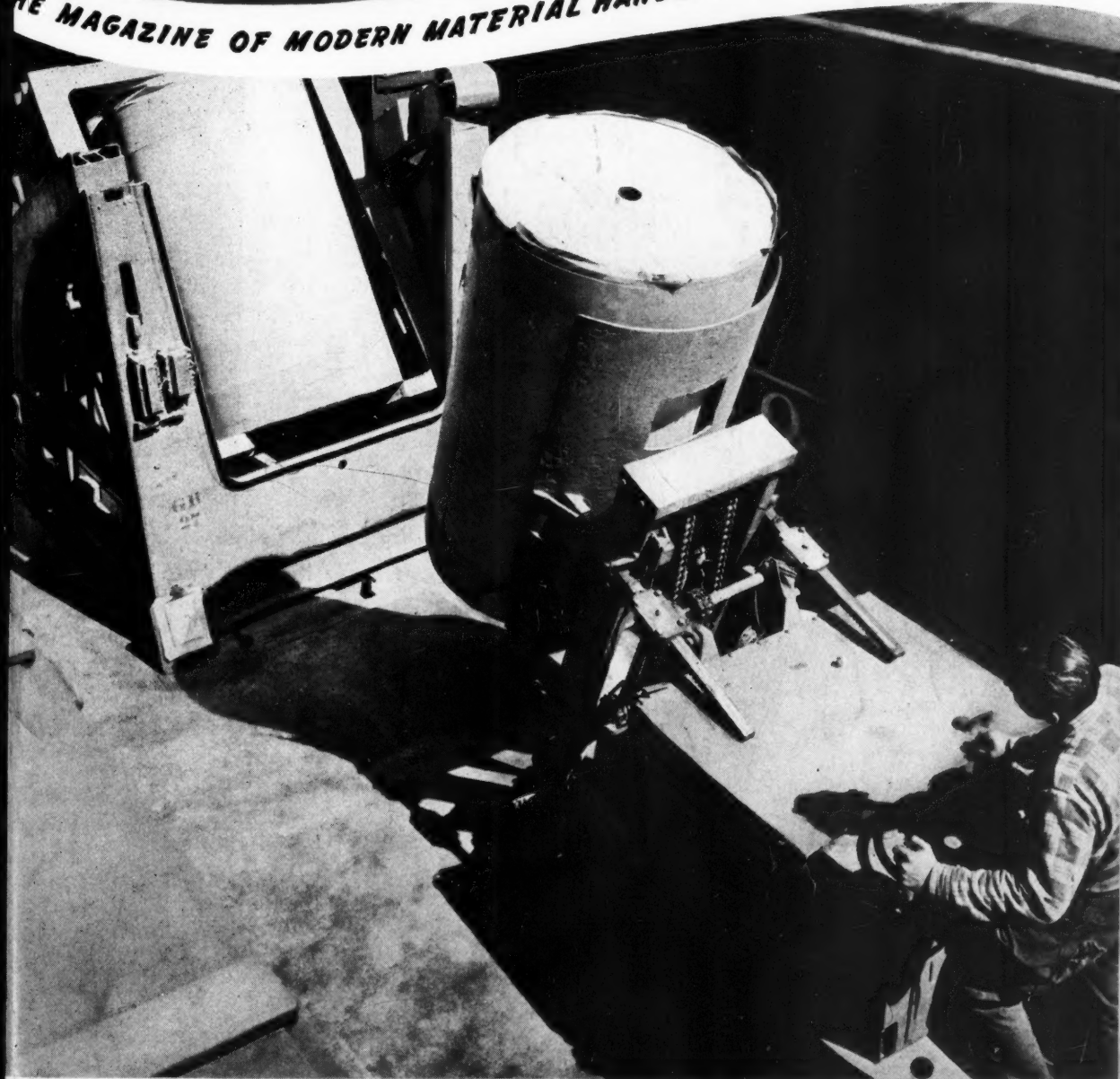
TECHNOLOGY DEPARTMENT

SEPTEMBER, 1949

Flow

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THE MAGAZINE OF MODERN MATERIAL HANDLING AND PACKAGING METHODS



IN THIS ISSUE: { Refrigerated Warehouse Handling . . . Crane Specifications
... Core Sand Supply . . . Copper Tube Mill Layout . . . Erie

THE "ZIP"

**WORKS FOR PENNIES
— SAVES DOLLARS**

Every Day!

Want to cut handling costs? Then take a tip — buy a Zip! It's a small investment that pays off in big savings, and not just for a year or two but for years to come.

There's no compromise in design. It's quality-built—from interchangeable mounting right down to the lifting hook—with features you'd expect only in far costlier hoists.

That's what makes the Zip-Lift the fastest selling wire rope hoist on the market. Ask a P&H representative for facts. Or write us today.

Handle it "Thru-the-Air"

Look At These Added Values



SAFER — Full magnetic control with control current reduced to 110 volts at the push-button. Plugging crane type limit switch and large double brakes provide maximum safety. No open wiring.

LIFETIME CONSTRUCTION — Precision built — shaved gears running in oil — grease-sealed antifriction bearings — fully enclosed, moisture-proof, dust-proof, acid-proof.

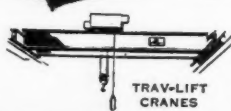
SMOOTHER OPERATION — Motor specifically built for hoist service — to withstand frequent reversal. Loads controlled within a fraction of an inch.

ALERT SERVICE — Out-of-stock delivery from qualified dealers everywhere—backed by 18 branch offices and 8 conveniently located warehouses.

The Zip-Lift is America's fastest selling wire rope hoist. Handle it "Thru-the-Air" at lower cost.

See how handling problems like your own can be solved by the Zip-Lift. Send for this picture-filled book of ideas, applications, specifications, etc. Ask for Bulletin H20-4.

Available in Capacities up to 2000 lbs.



P&H

ELECTRIC HOISTS

4643 West National Avenue
Milwaukee 14, Wisconsin

HARNISCHFEGER CORPORATION

CHICAGO MILWAUKEE CLEVELAND NEW YORK PHILADELPHIA PITTSBURGH ST. LOUIS ST. PAUL WASHINGTON

"There Must be Something Wrong Here, Boys"



And There Is if someone hasn't found the way to CUT HANDLING COSTS IN HALF!

Did it ever occur to you, with prices under pressure, sales declining, profits being squeezed, that your order to "Lay low on capital expenditures" actually has helped sky-rocket your costs?

Do you know that many large concerns have hit on almost a magic formula that gives quick relief from the headaches of rising costs? They found a way to CUT HANDLING COSTS IN HALF. That way, is the Automatic Electric Truck way.

These amazing electric trucks lift, move and stack your material ceiling-high with easy, finger-tip operation . . . hundreds of pounds, or tons. One operator handles more material than three workers could by antiquated manual handling methods, releasing two men for more productive work.

So, when your cost figures call for a showdown, instead of saying: "There must be something wrong here, boys", consider how much Automatic's 50% saving in handling costs could change your top-heavy costs picture.

And has it ever occurred to you, that your competitor can undersell you because he enjoys a large saving using Automatic Electric Trucks? Saleswise, for every \$5,000.00 saved in cutting handling costs, you earn the equivalent of a 5% profit on \$100,000.00 worth of sales!

Mail the coupon for all the facts . . . and then you'll see why Automatic equipment is not a capital expenditure, but a money-making, cost-cutting bonus, every time you handle material!

Automatic
ELECTRIC TRUCKS

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LIFE'S LOADS

Transporter
A PRODUCT OF AUTOMATIC

Lighten
LIFE'S LOADS

Trade **Automatic** Mark

141 W. 87th St., Dept. P-9, Chicago 20, Illinois
Please send me complete money-saving facts on amazing Automatic Electric Trucks without obligation.

Company name.....

By.....Position.....

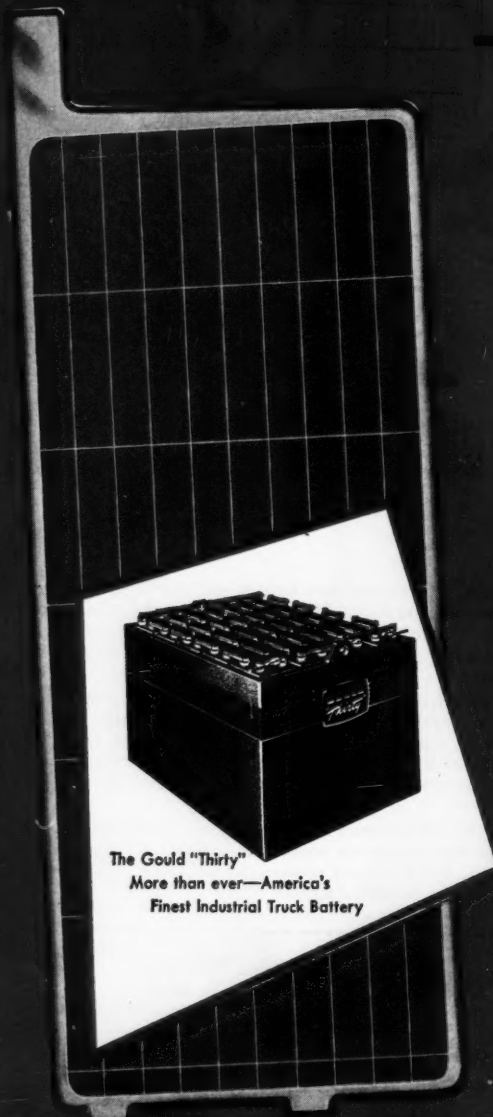
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GOULD "Z" PLATE—

*66% More Resistant
To Peroxidation!*

—ONLY GOULD HAS IT!



The Gould "Thirty"
More than ever—America's
Finest Industrial Truck Battery

Tests prove that the new progressive solidification and casting techniques employed in the "Z" Plate make the grid 66% more resistant to peroxidation! And why not? Here is the only positive grid in existence that is non-porous and completely solid all the way through—that produces full power throughout long battery life.

This is only one of the reasons why Gould "Z" Plate Batteries stay new longer . . . operate at full capacity more months! Another is a remarkable regenerative active material that renews its energy every day the battery is in use!

This revolutionary "Z" Plate didn't just happen. Its perfection required years of research in Gould's modern laboratories and almost endless testing in Gould's own pilot plant.

Gould "Z" Plate Batteries are so superior to anything heretofore available, you can't afford anything else. Decide NOW on Gould "Z" Plate Batteries. Write us outlining your requirements and we will be glad to submit a proposal by return mail.

GOULD

**STORAGE BATTERY
CORPORATION**

THENTON 7, NEW JERSEY

Always Use Gould Automobile and Truck Batteries

Flow

VOL. 4, NO. 12 • SEPTEMBER, 1949

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FRED FRISENFELDT
Industrial Publishing Co.
Room 403
1250 Wilshire Blvd.
Los Angeles 14, Calif.
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Flow Magazine is affiliated with the Industrial Publishing Company, which also publishes:

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COVER PHOTO—From the tilting device in background roll stock at The Lake Side Press, Chicago, is lowered to a ramp in the basement for transfer to storage. Power truck with spade attachment loads 3600 lb. rolls in tilting machine. From basement ramp, stock rolls on bed of another power truck. Vehicles of this type move hundreds of millions of pounds annually at this large printer.

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FLOW is indexed regularly by Engineering Index, Inc.

SUBSCRIPTION RATES

United States and possessions—
\$3.00 per year, \$5.00 for 2 years,
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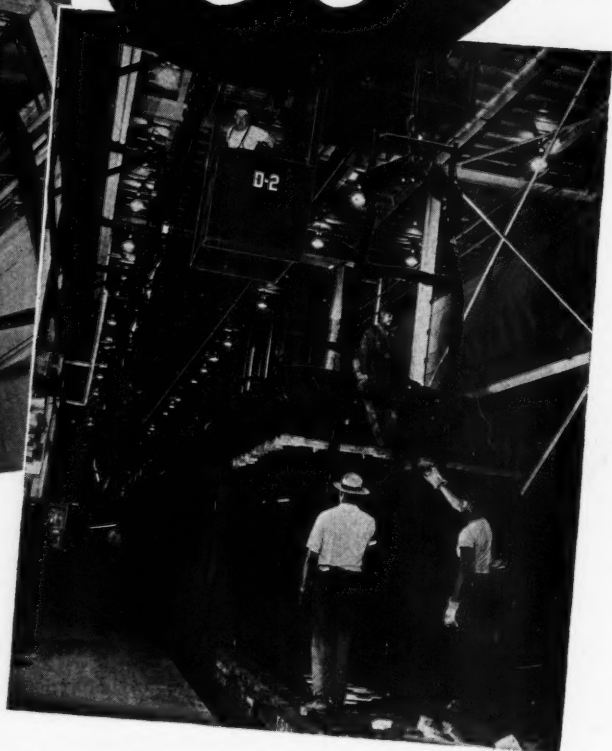
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CAR LOADING TIME

REDUCED

50%



To load 5440 automobile frames per day in railroad cars for transfer to assembly lines, formerly required 748 man-hours of dangerous labor. Since the installation of an American MonoRail specially designed system, this time has been reduced 50% and at the same time furnishing a safe method of performing the same operation.

The equipment consists of 2 special RailMaster cranes operating from cab control with variable speeds of 250 feet per minute for changing location from one car to another, and a micro-speed of 7 inches per minute to synchronize with the conveyor bringing the frames to the car. The jib boom operates at 10 r.p.m. variable

speed to permit handling of a frame every 10.6 seconds with perfect safety.

Let an American MonoRail engineer show you how American MonoRail Overhead Handling equipment will pay and save in your plant.

SEND FOR BULLETIN C-1.
A 56-page book showing
successful applications of
American MonoRail Systems.

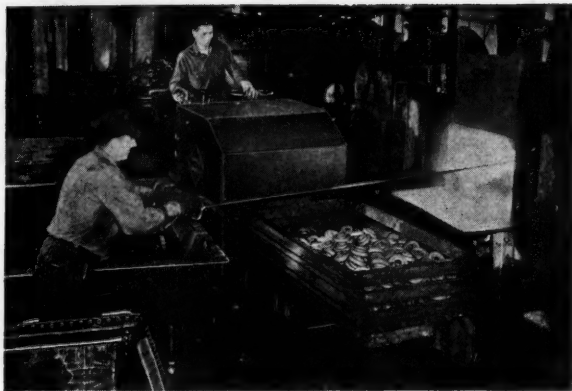


THE AMERICAN MONORAIL COMPANY

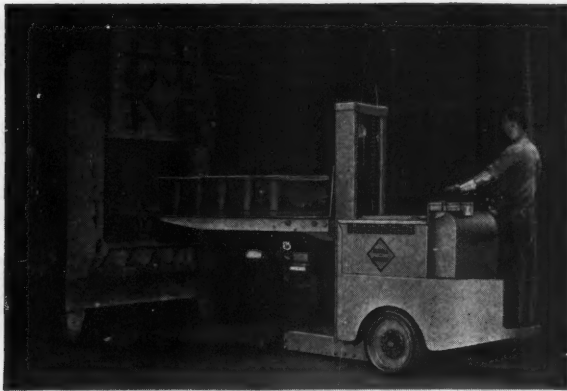
13129 ATHENS AVENUE

CLEVELAND 7, OHIO

SEPTEMBER, 1949 • FLOW



Parts are raked from heat-treating equipment into skid box on truck, then removed for cooling.



Truck platform enters annealing oven to deposit or remove loads. Truck works quickly to save gas or oil.

IN INDUSTRY'S
HOT SPOTS
ELWELL-PARKERS
Prove Their Mettle!

Working with metals at high temperatures is truly the No. 1 proving ground for industrial trucks. For over 30 years, Elwell-Parkers have operated on such work with safety, ease of control, and remarkable dependability. They readily handle jobs that are impossible manually. E-P Trucks also operate at speeds permitting synchronization of operations—so important with molten metals. Elwell-Parker electric trucks operate all over the plant, and they are assigned the toughest trucking jobs, because they always prove equal to them. The Elwell-Parker Electric Company, 4539 St. Clair Avenue, Cleveland 3, Ohio.



FREE BOOKLET
 on Handling of Hot Metals.
 Ask for E-P Reporter No. 7.

ELWELL-PARKER
POWER INDUSTRIAL TRUCKS

Established 1893



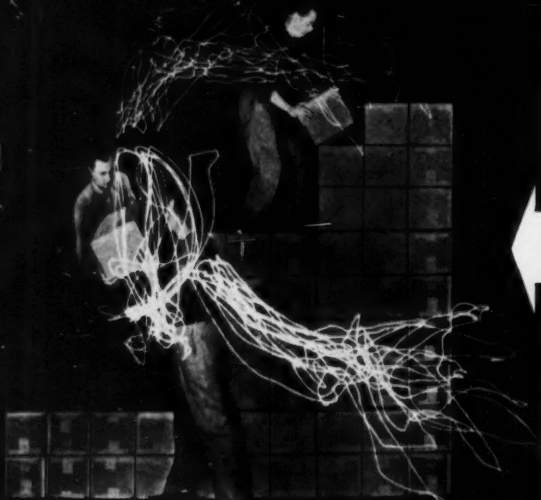
Pouring metal into bucket on truck, which then quickly carries load to foundry floor.



Moving rack holding 1,000 small cores into oven. Truck keeps ovens operating continuously.



E-P Electric Truck removing hot railway car wheels from foundry to cooling department.



Here, the camera plays detective and reveals the wasted time and effort involved in stacking boxes by hand. Light bulbs placed on worker's wrist record this waste motion.

WHY PILE UP COSTS *this way?*



cut costs with **BARRETT** **PORTABLE ELEVATORS**

Up . . . up . . . up go your costs . . . when you're willing to fritter away time and effort in hundreds of wasteful hand operations every day. But down come costs when you install Barrett Portable Elevators. One man does the work . . . does it quicker and more efficiently than 3 with old hand methods. That's the way to eliminate waste and save money in your plant!

Floor Space is Money, Too!

And you save plenty of it with Barrett Portable Elevators. Take these materials . . . often requiring floor level storage because they're too heavy for hand stacking . . . and pile them ceiling high. All that wasted air space is put to work . . . and floor space is cleared for extra production. And Barretts save, too, on heat, light and maintenance . . . perhaps even the cost of a new building.

Write for full details.

It's yours for the asking—the Barrett Junior Catalog. Write for it today.

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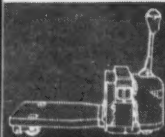


Barrett Portable Elevators are designed to perform hundreds of time- and labor-saving jobs. They are available with hand or electric operation—and with a wide choice of load capacities and lifting heights.

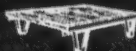


BARRETT

ONE MAN DOES MORE THAN 3 OR 4 . . . WITH A BARRETT



Barrett
Handling
Equipment



PORTABLE
ELEVATORS

STEEL
STORAGE BACKS

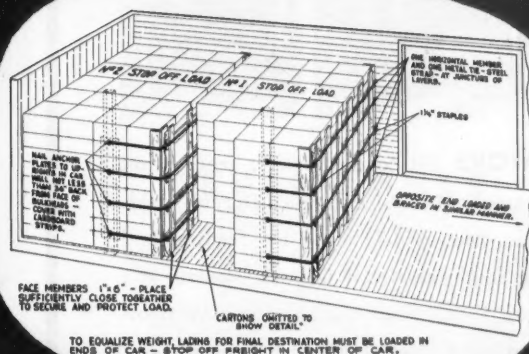
HOW BRAINARD STRAPPING SYSTEM OF STOP-OFF LOADING SOLVED PROBLEMS FOR ANCHOR HOCKING

SOME years ago the Anchor Hocking Glass Company, Lancaster, Ohio, analyzed their shipping problems. They found their loading time to be high, glass breakage in shipment excessive, and a demand by many customers for partial car lots.

Brainard Strapping specialists went to work, and soon car loading costs were down 30 percent, breakage enroute practically negligible, and by instituting the Stop-Off system of loading, partial lots could be delivered rapidly and economically.

Since those days hundreds of companies have turned to this method of car loading to speed deliveries and cut loading costs.

Remember—shipping costs add nothing to the value of the product. Brainard car loading and shipping experts can help you cut these costs to the bone. Don't delay—use the coupon. No obligation, whatsoever.

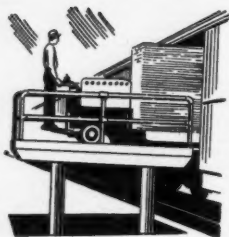


SHARONSTEEL

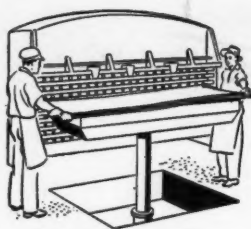
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Please send me the latest Brainard catalog on steel strapping and strapping accessories.

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Title.....
Company.....
City..... Zone..... State.....

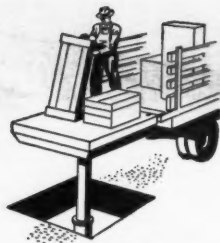
BRAINARD STEEL COMPANY
9 LARCHMONT AVE., WARREN, OHIO



Car Loading or Unloading



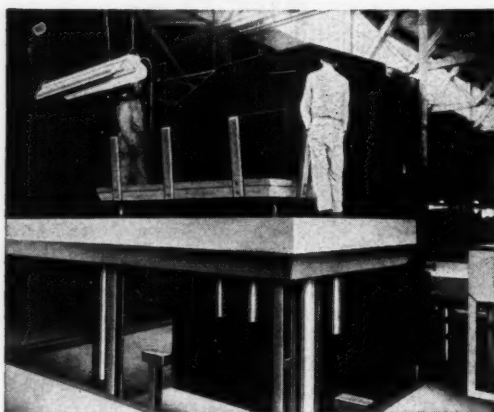
Machine Feeding



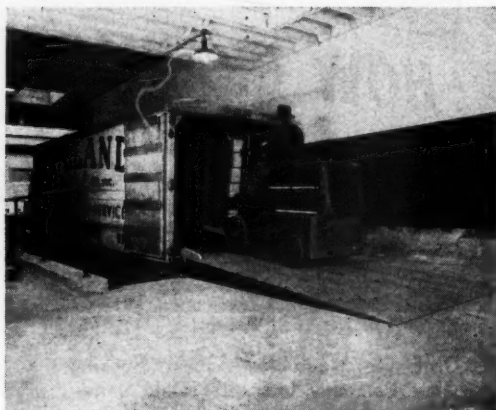
Loading Trucks

LIFT LOADS FASTER

Cut Labor Costs up to 50%



LEVELATORS lift loads directly from plant floor to trucks, freight cars, or different building levels. Also widely used for feeding and receiving materials from presses, shears, etc. Levelators speed plant traffic, conserve manpower, cut costs. Save plant space, too—no need for ramps. Installation simple, inexpensive.



LEVA-DOCKS are self-leveling, hydraulic ramps for loading docks. One end of platform is hinged into loading dock; other end automatically travels up and down as truck springs are relieved or compressed during loading or unloading. Supporting arms and "throw-over" bridge connect ramp and truck bed.



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Oildraulic Levelators and Leva-Docks

ROTARY LIFT CO., 1009 Kansas, Memphis 2, Tenn.

ROTARY ALSO MAKES OILDRAULIC ELEVATORS — FOR FREIGHT AND PASSENGER SERVICE

EXIDE-IRONCLAD BATTERIES ARE DIFFERENT!

They are specially designed to provide years of dependable service in all MOTIVE POWER WORK

Storage batteries are called upon to perform many tasks. No single type of battery is adequately suited to all. To meet these numerous requirements, Exide engineers have developed special types, to fit each application.* Among these several types is the specially designed Exide-Ironclad Battery. Details shown below.

VENT PLUG specially designed to prevent escape of electrolyte.

GREASE SEAL RING NUT holds battery elements securely in place . . . prevents creepage of electrolyte . . . keeps tops clean and dry.

SEALED CELL COVER flush with top of jar. Prevents collection of dirt or moisture . . . keeps impurities out of cell . . . eliminates leakage of electrolyte.

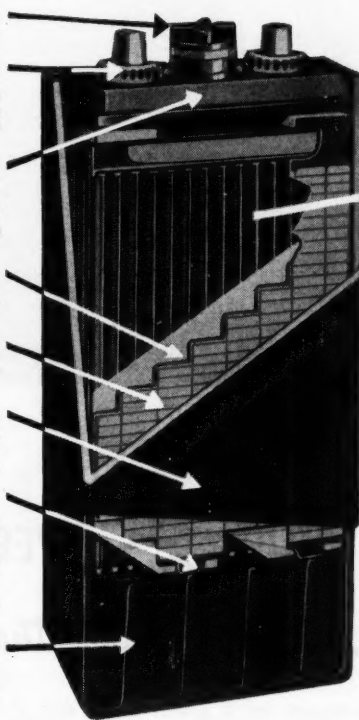
SEPARATOR of high porosity, specially treated to last the life of the battery.

NEGATIVE PLATE made extra heavy and built to match the long life of the positive plate.

JAR made of specially tough and durable Giant Compound. Built to withstand the jolts and jars of hard industrial usage.

FEET. Internal short circuits practically eliminated because the two feet on negative plate rest on different ribs from those of the positive plate, and because separators extend below both plates and rest on all four ribs.

RIBS support all plates and separators. Their height provides generous sediment space so that internal cleaning is unnecessary.



DIFFERENT IN DESIGN

DIFFERENT IN CONSTRUCTION

DIFFERENT IN SERVICE QUALITIES

Chief among these differences is the unique positive plate, an exclusive Exide feature.

EXIDE-IRONCLAD POSITIVE PLATE

Consists of a series of finely-slotted tubes which contain the active material. So small are these slots that, while permitting easy access of electrolyte, they retard the active material from readily washing out or jarring loose . . . adding considerably to life of plate.



Exide-Ironclad Batteries have ALL FOUR of the characteristics that a storage battery must have to assure maximum performance from battery electric industrial trucks—high power ability, high electrical efficiency, ruggedness and a long life with minimum maintenance. The combination of these four Exide-Ironclad characteristics assures years of dependable day-in, day-out service.

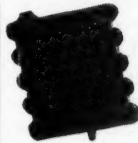
DEPENDABLE POWER



"Exide" and "Exide-Ironclad"
Reg. Trade-marks U. S. Pat. Off.

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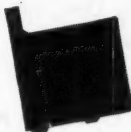
DESIGNED FOR STATIONARY USE



The Exide-Manchex Battery has the manchester type positive plate with the lead button construction. Specially designed for stationary use in many classes of industry.

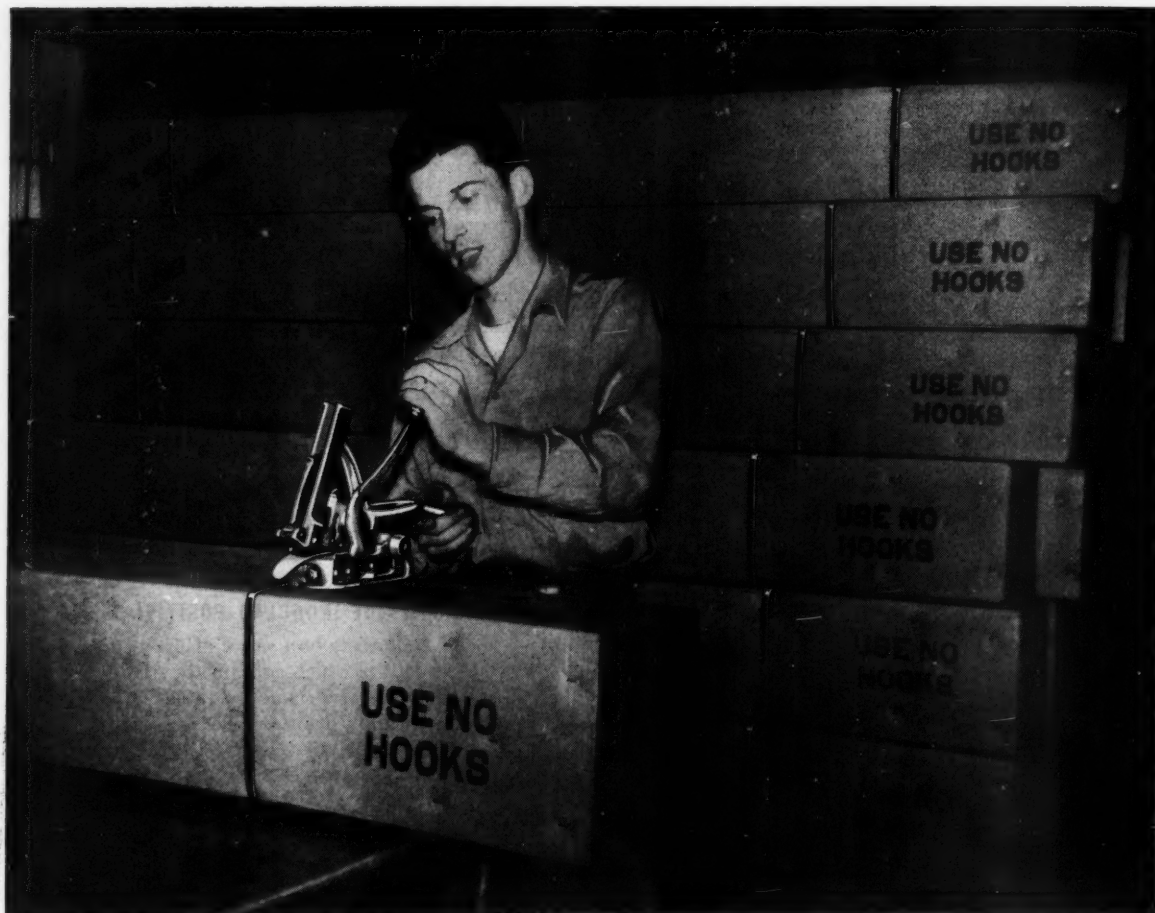
DESIGNED FOR AUTOMOBILE USE

The Exide Automobile Battery has plates of staggered grid construction. Specially designed for use in automobiles, trucks, buses, aircraft and numerous other applications.



1888...DEPENDABLE BATTERIES FOR 61 YEARS...1949

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 • Exide Batteries of Canada, Limited, Toronto



STEEL STRAPPING EQUIPMENT PAYS FOR ITSELF IN JUST **3** WEEKS *-- for this Leather Manufacturer!*

Here's more concrete *proof* for you that Stanley Steel Strapping can cut shipping costs of almost any type product. This leading leather manufacturer, trying to speed up his shipping operation and reduce expenses, called in a Stanley representative to make a personal survey. The situation called for a Stanley Ace Strapping Tool.

Result: the number of units packed and

strapped in a given time was doubled. The equipment paid for itself in just three weeks.

Stanley Steel Strapping is quick and easy to apply—saves man-hours and materials—gives greater protection to goods in transit. Let us show you the savings it can make in *your* shipping room. Write for details or for a representative to call now! The Stanley Works, Steel Strapping Div., 203 Lake St., New Britain, Conn.



Reg. U.S. Pat. Off.

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AND CAR BANDING SYSTEMS

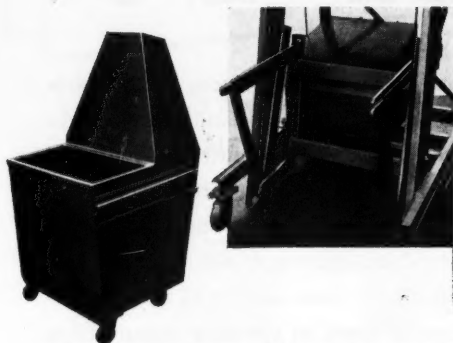
HARDWARE • HAND TOOLS • ELECTRIC TOOLS • STEEL STRAPPING.

SPEED UP 100 TIME-WASTING JOBS

LIFT and DUMP BAGS, BULK, DRUMS



Made in various heights.
Locks in place with foot
pedal. Dumper and skips
roll on casters.

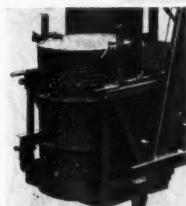


FREE ROLLING SKIPS lock on the arms of the Cesco Dumper for lifting and dumping. They roll on Colson Casters from stock pile to scale to the Dumper and save hours of extra handling.

A variety of skips and loaders are available including: bag dumpers, drum dumpers, dust control types and many others. If you have a handling problem requiring lifting, upending and dumping—it may already have been solved and filed in our Cesco Dumper case histories—write today for information.



BAGS



DRUMS



BULK

DUMPING HEIGHTS
5, 6, 7, and 9 feet



ALL KINDS OF MATERIALS can be handled easier and faster by a single Cesco Dumper and its variety of skips. That's why it's just as useful in receiving department and loading dock as in warehouse and mixing rooms. It moves on its own casters and locks in place with two floor locks. It lifts the load by cable and pulley powered by a half horsepower electric motor. Has a lifting capacity of 500 lbs. or 6 cu. ft; can handle up to 50,000 lbs. per hour. Three button control switch—UP, DOWN and STOP—acts instantly and stops the travel without coasting.

Cesco dumpers are made in standard dumping heights of 5, 6, 7, and 9 feet and in other sizes on order. Many special types of skips are made for specialized jobs.

The Cesco Dumper prevents waste by spillage . . . eliminates accidents to labor . . . reduces costs of handling dry materials or liquids in bags, bulk or drums.

COLSON Equipment & Supply Co., 1317 Willow St., Los Angeles



WRITE FOR LITERATURE

Here are eight picture-packed pages showing the various uses of the Cesco Dumper and its mechanical features. Write for your copy today!



FILL IT...ROLL IT...WEIGH IT...ATTACH, LIFT AND DUMP IT



AMPLE POWER



FINGER-TIP CONTROL



Mobilift has models ranging in capacity from 2000 pounds to 3500 pounds. Yet with ample power to handle such loads, Mobilift is designed for easy finger-tip control. Its tilt, its lift, and its patented disc clutch are all controlled by easy-working levers located together at convenient finger-tip level. Mobilift has no gears to shift, making it the most maneuverable of all lift trucks. These facts add up to ample load-carrying ability plus unusual speed of operation—more trips per hour, more tons of materials moved per day.

Mail the coupon below—let us show you how Mobilift combines ample power and easier control for more economy and efficiency in materials handling.

MOBILIFT CORPORATION

835 S.E. Main St., Portland 14, Oregon

Please send me your illustrated folder on
Mobilift operation.

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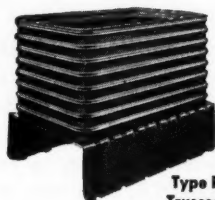
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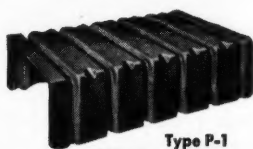
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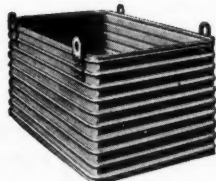
TRUSCON STEEL BOXES AND STEEL SKIDS



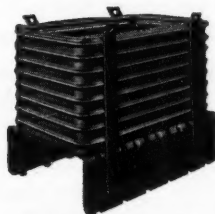
Type PB-120
Truscon Steel
Box and Platform



Type P-1
Truscon One Piece
Steel Skid Platform.



Type B-80C Truscon Box
Equipped for Crane Handling.



Type PB-120L Truscon
Box and Platform with
full length lifting lugs.

● National surveys show that about 42¢ of every payroll dollar is spent on the handling of material.

Truscon Steel Boxes and Skids can help you cut down this high cost item and assure bigger plant operation returns!

Eliminate nondescript containers, inefficient carrying methods and the loose heaps of parts and finished products that delay progress. Relieve your employees of time-wasting hand-handling operations that cut so deeply into profits.

Truscon Steel Boxes and Skids will assure you more efficient movement and delivery of materials to production lines . . . more efficient storage of parts and finished products . . . more man hours gained and more jobs completed.

There is an experienced Truscon man near you to help plan a better, faster flow in materials handling for you. Write for booklet No. P-70.

TRUSCON STEEL COMPANY • Pressed Steel Division

6204 TRUSCON AVENUE

CLEVELAND 4, OHIO

SUBSIDIARY OF REPUBLIC STEEL CORPORATION

What's Your Bulk Handling Problem?

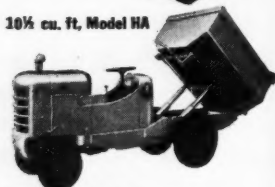


Coke • Coal • Cinders
Scrap • Sand • Clay • Slag
Chemicals • Waste
Sawdust • Lime • Abra-
sives • Stone • Sulphur
Cement • Fertilizer
Ore • Gravel • Brick
Tile • Cullet • Pigments
Salt • Sugar • Fine Dust
Soap • Peanuts
Dried Fruit • Snow
Barrels • Bales

Unload and Load Box Cars — Carry — Load Trucks, Cars — Charge Hoppers — Fill Bins



10½ cu. ft. Model HA



2 cu. yd. Payloader Buggy



¾ cu. yd. Model HF



1¼ cu. yd. Model HL



1½ cu. yd. Model HM

Bulk materials of any kind can become bottlenecks in any plant. They can also "hog" valuable floor space and discourage good plant housekeeping. Makeshift handling methods result in fatigue and physical injuries . . . slow down your operations and raise the cost of your production.

Hough PAYLOADERS are *designed* and built to provide a fast, flexible materials handling system . . . to cut time and costs . . . to boost output per manhour. PAYLOADERS are equipped to increase your production area by reducing your present storage space — to handle the largest loads per operation — to bring neatness into your plant. It's easy to pick up full loads of any bulk material with a PAYLOADER. It's easy to load your materials into hoppers or bins — high or low — by means of its quiet and dust-reducing hydraulic dumping mechanism.

PAYLOADERS also pay an extra bonus by doing many odd chores . . . pushing, pulling, lifting, spotting cars, loading and plowing snow, cleaning yards, leveling waste dumps and grading.

FREE LITERATURE

on any units of the complete PAYLOADER line is yours for the asking.

PAYLOADERS are dependable — because they are the result of materials handling experience since 1920.

The Frank G. Hough Co., 731 Sunnyside Avenue
Libertyville, Illinois

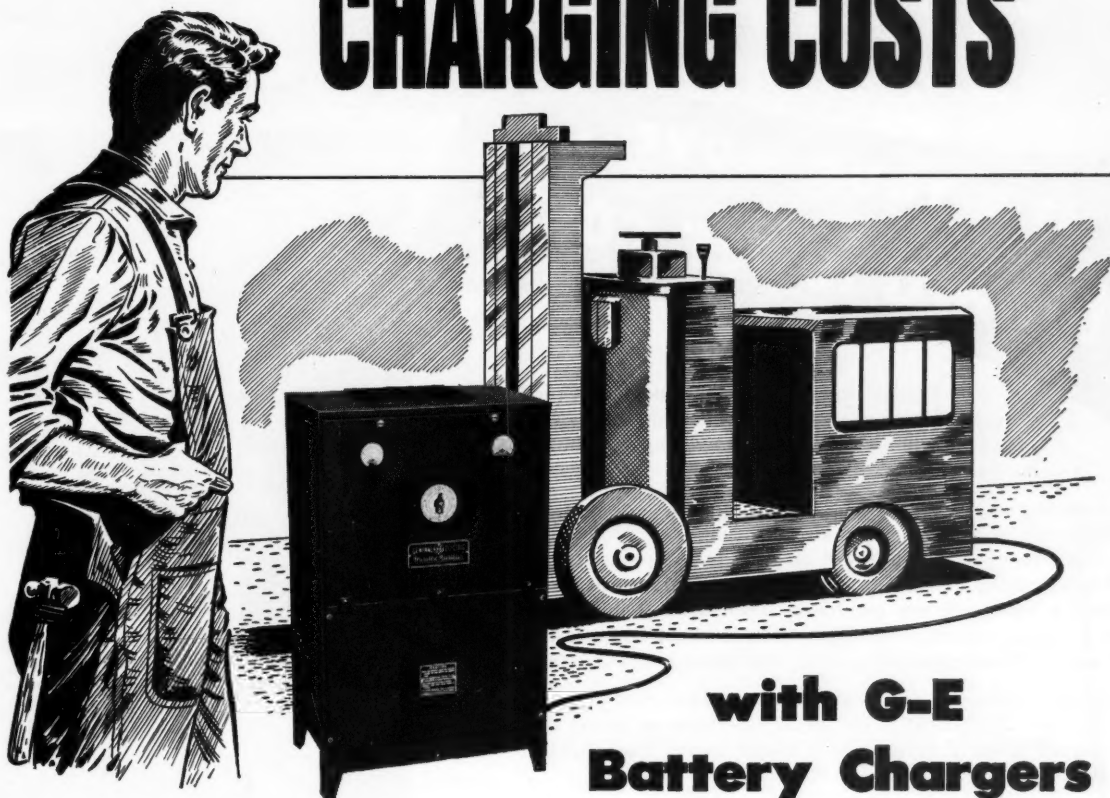


HOUGH PAYLOADER

Manufactured by THE FRANK G. HOUGH CO.



GET LOW ELECTRIC-TRUCK CHARGING COSTS



with G-E Battery Chargers

- **Low Current Costs**

The heart of the G-E Battery Charger is its copper-oxide rectifier stack—proved highly efficient throughout a virtually unlimited life.

- **Low Maintenance Costs**

Nothing moves except a fan, requiring only occasional lubrication—plus full protection against both mechanical and electrical failures.

- **Low Labor Loss**

Spotting these economical chargers throughout a plant means no long wasteful excursions to

charging areas. No waiting for an expert to hook up charging apparatus. Special training or skill is not needed to use a G-E Battery Charger. It's simple—automatic.

- **Low Battery Costs**

Two-rate charging safely brings batteries up to full charge. Starting with a fast charge when the battery is in a discharged condition the battery charger rapidly builds up a substantial charge then automatically tapers off to a slow, safe finishing rate. This safe, gentle handling during charging helps batteries maintain their full rated service life.

*For complete details see your local electric truck dealer or write
Apparatus Department, General Electric Co., Schenectady 5, N. Y.*

GENERAL  ELECTRIC

486-308

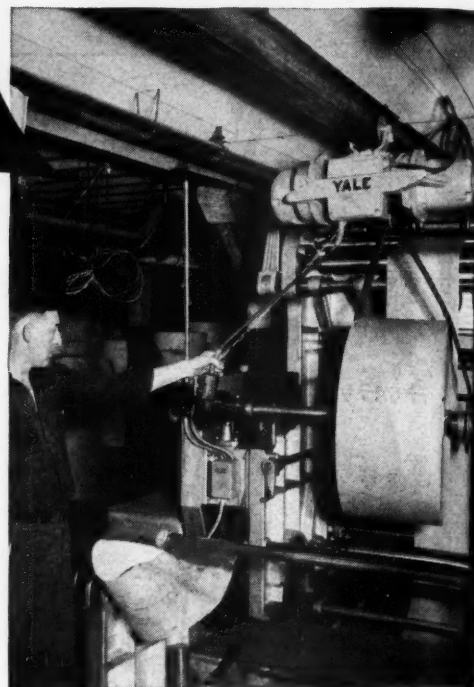


IT'S YOUR MOVE... toward lower costs

Efficient motion is the key to efficient production. But no longer can industry confine efficient motion to processing operations. Now *material handling* must be included if you hope to cut costs substantially.

Material handling takes a 30% slice out of every production dollar. To reduce that cost thousands of companies are already using Yale Material Handling Machinery. For example, \$300 is saved on each press produced by a manufacturer in Ohio by using Yale Hoists. A grocery warehouse spent \$44 to unload a box car until a fork truck was purchased. Then the cost dropped to \$7. In another case a company gave up counting parts by hand and now uses a Yale Scale to count by weight. Result: greater accuracy and many hours saved each week.

You want lower costs and you want them now. Our nearby representative will gladly give you the benefit of his broad experience in saving time, effort and money for all kinds of businesses. It's your move! Phone him—or write direct to Yale.



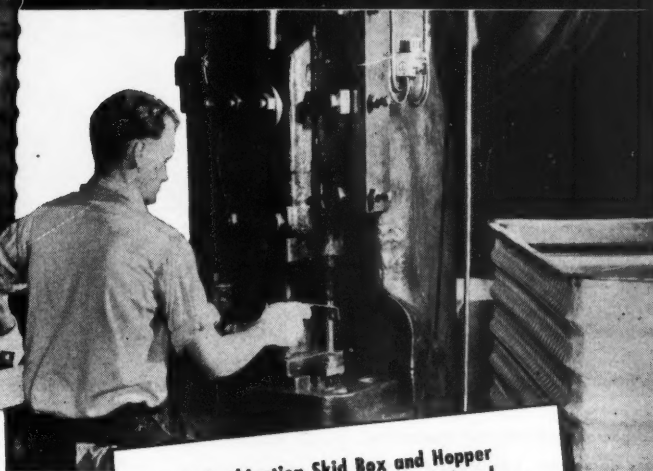
THE YALE & TOWNE MANUFACTURING CO.

Department L-66 • Roosevelt Boulevard • Philadelphia 15, PA.

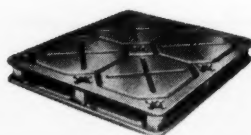


MONROE DROP-BOTTOM SKID BOXES

PUT GRAVITY
on your payroll



- Exclusive Monroe Drop-Bottom Skid Boxes cut labor and handling costs as much as 20%. Hand lever releases hinged bottom of box, sliding stampings, castings and other small parts into waist-high tray of matching work stand.
- By keeping parts in convenient work position, Drop-Bottom Boxes eliminate stooping, bending and reaching—speed production operations.
- Monroe Drop-Bottom Skid Boxes available in 6 different sizes and weights with separate work stands for each. Rugged steel construction.



MONROE 8-WAY STEEL PALLET streamlines handling and shipping. Permits entry of fork truck from 8 different directions, pallet truck from 4 different directions. Nine hollow anchoring posts facilitate solid tying.

Write for literature on Monroe's complete Material Handling Equipment line, including: Drop-Bottom Skid Boxes; 8-Way and 2-Way Steel Pallets; collapsible wire and standard skid boxes; standard platforms, skids and nestling rings, and various accessories.

A Combination Skid Box and Hopper
with Separate Matching Work Stand



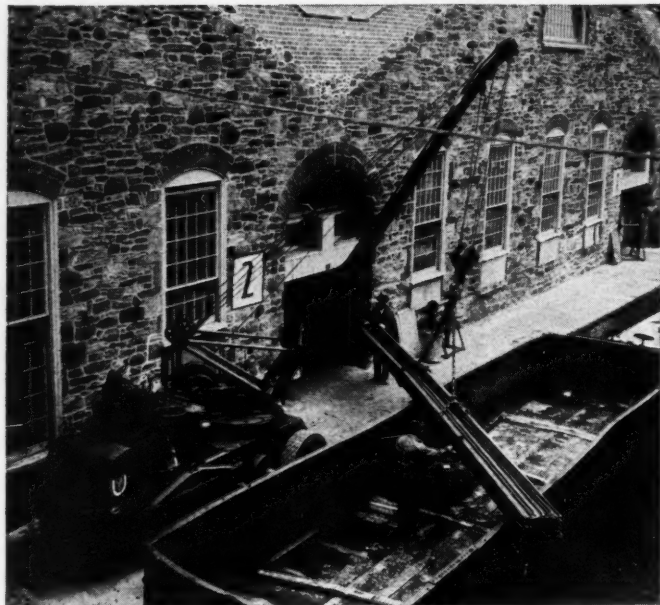
Monroe Drop-Bottom Skid Boxes are easily removed and replaced on work stands by ordinary high lift trucks. Work stands are available with a choice of trays to deliver parts to the front, or to the right or left side.

MONROE®

MONROE AUTO EQUIPMENT CO.

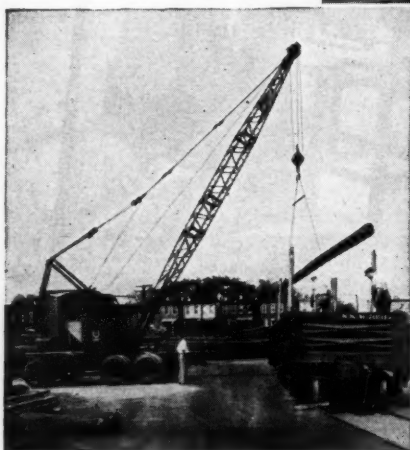
Monroe, Mich. — World's Largest Maker Of Ride Control Products

Expedite MATERIAL HANDLING STORING—ASSEMBLING



Cargocrane unloads strip steel at factory warehouse. Low slung and with telescopic boom, it can carry its load right into the building.

Zephyrcrane makes light work of unloading and piling poles.

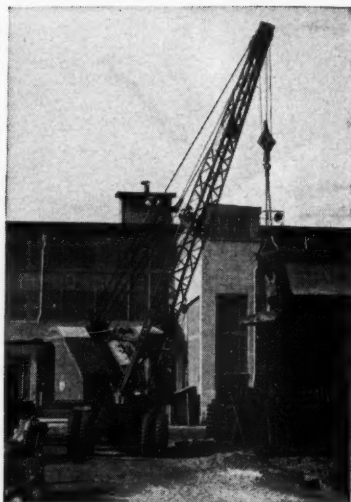


This book illustrates and describes many different applications of Link-Belt Speeders to material handling. You'll find helpful information and suggestions here—Send for a copy—NOW!

with

**LINK-BELT
SPEEDER**

Shovel-Cranes



UC-55 expedites handling of heavy steel castings. HC-70 Truck-Crane in wide area storage yard. With speeds up to 30 m.p.h. the Truck-Crane cuts travel time to minimum.

Loose or bulk material, steel and lumber, product parts in course of assembly—you handle any or all of them effectively with Link-Belt Speeders.

Lifting attachments are quickly interchangeable to provide hook-block, grapple or clamshell bucket for any specific type of material.

Link-Belt Speeder wheel-mounted cranes range from the YC-9 with a lifting capacity up to 10 tons, to the HC-90 truck-crane with capacity of 25 tons, and boom lengths of 100 feet plus jib.

11,403

LINK-BELT SPEEDER

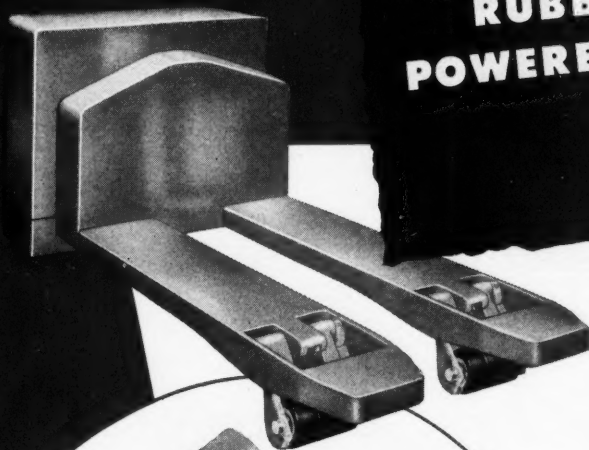


LINK-BELT SPEEDER CORPORATION
CEDAR RAPIDS, IOWA

Builders of the Most Complete Line of
SHOVELS—CRANES—DRAGLINES

Stop Floor Damage with the

NEW DIFFERENTIAL-ACTION RUBBER-TIRED POWERED PALLET LOADER WHEELS



NEW

NO BIND. Aerol's differential-action allows free independent rotation of each wheel. Ends scuffing.



OLD

GOUGING. Obsolete solid wheels bind and gouge at corners when turning. Ruin floors.

AEROL
CO. INC.

NOW! Replace expensive, short-lived fibre wheels and outmoded, noisy steel rollers which cause so much costly damage to your floor surfaces.

Eliminate Floor Maintenance

Grooving, gouging, chipping, scuffing, halted by differential-action obtained through a series of three independently rotating rubber-tired wheels—separated on the axle by oil-impregnated anti-friction thrust washers and revolving on heavy duty oilite bushings or, where applicable, on factory lubricated and sealed needle bearings.

Long, Noiseless Life

Field tests evidence wear characteristics comparable to steel rollers and many times greater than that of fibre, while a smooth, quiet, effortless operation lessens worker fatigue.

Shock Absorbing

Rubber treads cushion impact...preventing transmission through the load and vehicle.

Furnished as a complete easy-to-install replacement kit...detailed assembly instructions included...neither special tools nor fixtures required.

Available for such popular vehicles as LEWIS-SHEPARD, YALE & TOWNE, AUTOMATIC...

NO WHEEL ROLLS LIKE AN  **AEROL**

GUARANTEED 20% EASIER ROLLABILITY

SEE YOUR AEROL DISTRIBUTOR.
WIRE, WRITE OR PHONE FACTORY.

AEROL CO., INC. 2020 ONTARIO STREET, DUNBANK, CALIFORNIA

Keeping the Navy "Ship Shape" with the Dempster-Dumpster . .



Shipyards, stations, and the men in Uncle Sam's Navy set a standard of cleanliness that is unsurpassed. Helping to maintain this high standard of Navy cleanliness is the Dempster-Dumpster System of materials handling . . . a system of quick pick-up of preloaded containers for hauling, dumping or moving materials.

Exactly 10 years ago the Navy purchased its first Dempster-Dumpster equipment . . . one truck hoisting unit with several containers. Now there are dozens of hoisting units and thousands of Dempster-Dumpster containers of many types at work keeping Navy yards and stations "ship shape." The sturdy steel foolproof and fireproof containers are placed at various places, such as barracks, mess

halls, the docks and ship yards, wherever materials (solids or liquids) need be deposited immediately as they accumulate. A Dempster-Dumpster truck hoisting unit quickly picks-up each container when it is filled and hauls it to the disposal area. Contents are automatically dumped and container returned.

If you have a materials handling problem demanding more cleanliness, more economy, and more efficiency, it will pay you to investigate the Dempster-Dumpster System—popularly used, not only by the armed forces, but by municipalities, leading industrial plants, and by large and small institutions of all kinds.

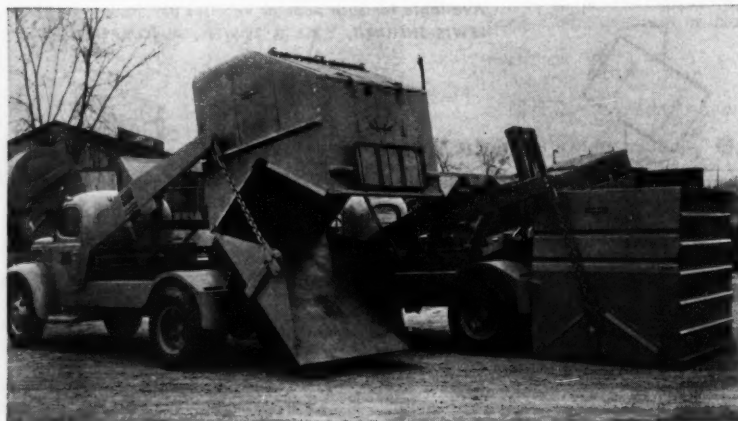
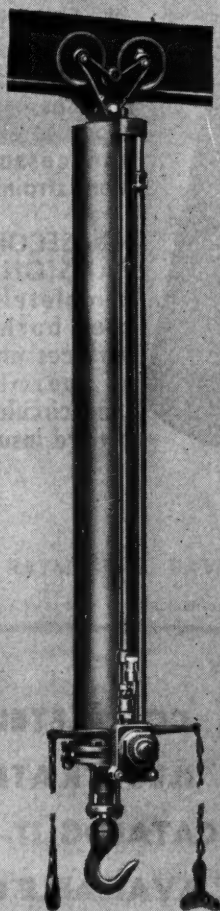


Photo above shows eleven hoisting units recently delivered to the U. S. Navy. Various types of containers are shown in carrying positions. Photo at left shows a hoisting unit preparing to lift a 10 cu. yd. Flat Top container, while another hoisting unit is dumping a 9 cu. yd. Trash and Rubbish Collector-type container. All controls of unit are conveniently located at the driver's seat. One driver and one truck handles any number of containers regardless of types.

**DEMPSTER
BROTHERS
INC.**

CURTIS AIR CYLINDERS

Increase Plant Efficiency—Decrease Production Costs



Curtis Air Cylinders
for lifting, lowering,
pushing or pulling

GIVE YOU—

- Smooth, fast, accurate control of loads
- Capacities exceeding 10 tons
- Finger-tip control — one-man operation
- All-steel construction
- Immunity to overloads
- Low first cost, lowest operating expense
- Indoor and outdoor service

*It will pay you to
investigate Curtis first*

95 Years of Successful Manufacturing

CURTIS

PNEUMATIC MACHINERY DIVISION
of Curtis Manufacturing Company
1909 Kienlen Avenue, Saint Louis 20, Missouri

Curtis Pneumatic Machinery Division of Curtis Mfg. Co.
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149-3

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<input type="checkbox"/> Air Hoists	Name.....
<input type="checkbox"/> Air Cylinders	Firm.....
<input type="checkbox"/> Air Compressors	Street.....
	City.....Zone.....State.....

FIVE-FOLD *Slyver-Clad*

● **KOROSEAL Perforated Retainer** . . . two used . . . bottom grid frame completely insulated . . . envelopes entire plate and presses against Slyver and two glass mats.

● **MICROPOROUS RUBBER SEPARATOR** . . . impervious to heat, electrolyte and oxidation . . . close spaced for uniform pressure against Slyver-clad plates . . . high porosity and low electrical resistance.

● **SLYVER** . . . thick layers of infinitely fine glass fibres . . . laid parallel in vertical position . . . America's **BEST** retention.

● **EXPANSION MAT** holds Slyver firmly in place . . . provides expansion space to eliminate unnecessary element strains.

● **SECOND EXPANSION MAT** completely envelopes both plate surfaces and sides . . . permits free acid circulation . . . a third insulator.



**COMPLETELY
ILLUSTRATED
CATALOG IT-515
AVAILABLE ON
REQUEST**

C & D BATTERIES, INC.

TELEPHONE • DIESEL • ELECTRIC INDUSTRIAL TRUCK • LOCOMOTIVE • STARTING & LIGHTING
Established 1906 of Conshohocken, Pa. SALES AND SERVICE IN PRINCIPAL CITIES



Fork Trucks and Pallets

PALLETS FOR MEATS. Uprights attached to pallets have crossbars of pipe, are detachable for storage purposes.

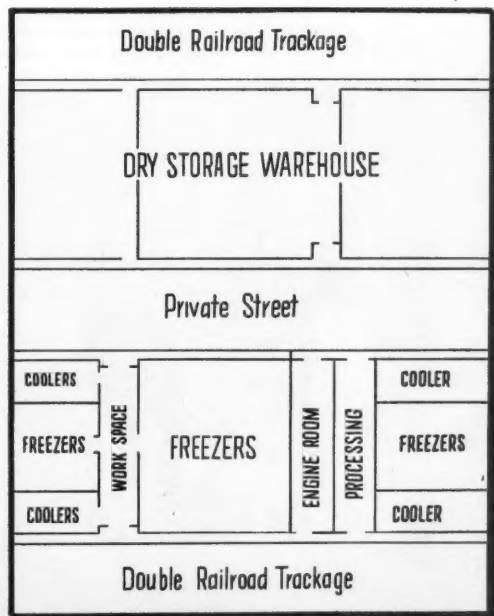
REFRIGERATED WAREHOUSE HANDLING . . .

By **RAYMOND L. DAVIS**

Superintendent of Warehouses
Alford Refrigerated Warehouses
Dallas, Texas

THE modern refrigerated warehouse, storing millions of pounds of frozen foods, keeps many storage rooms at temperatures well below zero. A workman cannot stay in this temperature for long periods and maintain efficiency. He cannot go into a frozen storage room, work long enough to become thoroughly chilled, then return to outside temperatures that are radically different, without suffering shock. These conditions make it necessary for the work to be

SCHEMATIC LAYOUT
sketch includes traffic facilities, also work areas between storage rooms.



planned in order to protect him from the effect of sudden extremes in temperature.

Plan for Speedy Handling

With these things in mind, the new Alford Refrigerated Warehouses at Dallas, Texas, were planned to maintain the highest speed in moving frozen food products in and out of storage.

Following are the essentials set up when President Fred F. Alford decided to build the biggest refrigerated warehouse in the world: 1. One-story construction. 2. Plenty of dock space for trucks and railroad cars. 3. Ample space for maneuvering highway trucks without interference from city traffic. 4. Plenty of work room for warehousemen. 5. Accessibility to railroads and highways.

6. Operations as completely mechanized as possible to insure the absolutely essential factor of speed. This involves stacking of merchandise on wooden pallets. 7. Careful planning of operations to insure speed and efficiency for the protection of foods and workers.

While Mr. Alford had operated principally in the frozen-storage field in his old storage center, he also wanted space for dry storage

in his new location to equal that of the refrigerated space. Consequently there are two identical buildings. One is for refrigerated storage, the other for dry storage. Both are operated from one engine room.

The refrigerated building, part of which is in use, operates from 20 degrees below zero to 50 degrees above. The dry storage building, also partly in use, is air conditioned to maintain a cool, dry year-around temperature of 70 degrees.

Layout for Accessibility, Short Hauls

This operation is on such a large scale for its particular industry that careful description of plant layout is necessary to show how it is related to material handling.

The two buildings are 250 ft. wide by 1,760 ft. long, both separated by a concrete-paved private boulevard 100 ft. wide. On the outboard side of each building are double railroad tracks accommodating 80 cars at dockside and 80 cars on parallel tracks.

The storage rooms are separated by extensive work areas serving both the docks and the rooms. The floor plan is such that operators of fork lift trucks can drive to any part of either warehouse from any point on any of the four docks (two truck docks, two railroad

docks). This was achieved by building ramps at each end of both buildings. However, the plan is such that long drives are not necessary. Incoming trucks, reefers or box cars are spotted as near as possible to the storage room to which a shipment is assigned. The feature of complete connection of all dock and storage spaces facilitates the placing of empty pallets at convenient points, as well as their movement to other locations as the need arises.

The one-story construction is regarded as a most important factor in the efficiency of this facility, which was designed for mechanized operation.

Work Areas, Automatic Doors

The dockage—more than a mile of it—insures space for spotting trucks and railroad cars without delay. It insures adequate dockage for any conceivable rate of merchandise turnover. The docks are 15 ft. wide, giving fork lift trucks room for maneuvering and passing each other.

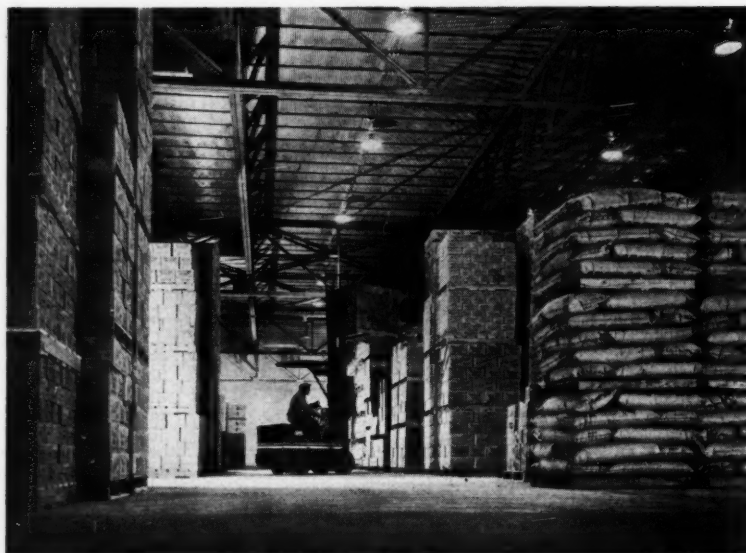
In providing ample space for maneuvering highway trucks without interference from city traffic, Mr. Alford took a lesson from his old storage center. It is a cluster of buildings that just grew up fronting on a narrow city street. Operators of large trucks had to consider not only the spotting of their trucks at these docks—they had to watch traffic not connected with the warehouse. The 100-ft. private boulevard running the length of the new center insures room for maneuvering and freedom from outside traffic.

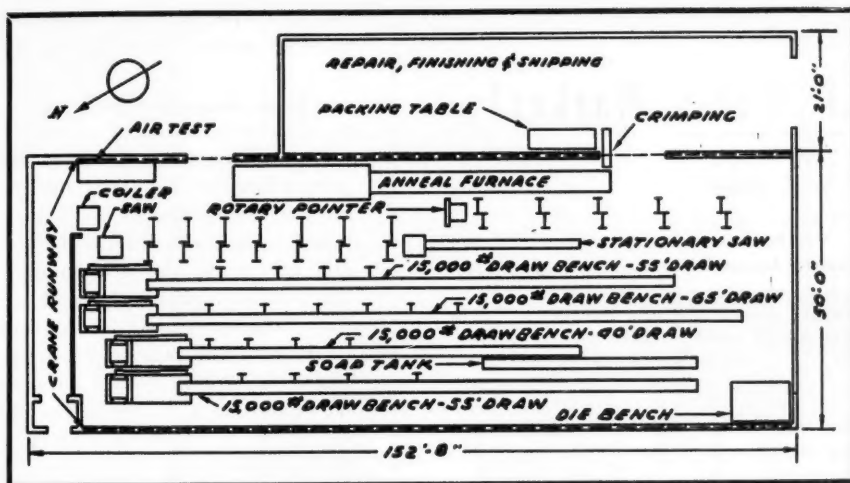
The provision of plenty of work room for warehousemen is another factor in speed and efficiency. This is taken care of partly by the wide docks, the rest by the extensive work spaces that cut across the warehouses between groups of storage rooms. Fork lift trucks can move at efficient speeds, load or unloaded, without delay.

The work spaces in the refrig-

(Turn to page 62)

TRAINED TRUCK operators make neat warehouse. Space inventory is with electric card system which records every package.





Electric bridge crane,
racks, casted equip-
ment, fork truck.

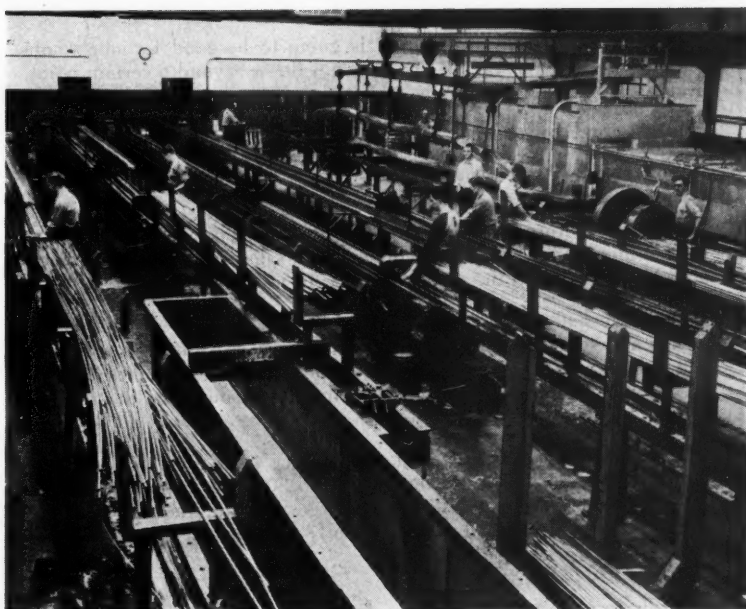
SKETCH OF TUBE
MILL LAYOUT shows
the maximum use this
company obtains from its
10,000 sq. ft. of space.

Long Lengths in a Compact Layout

The layout of this copper tube mill of 10,000 sq. ft. was designed for easy handling of long lengths in narrow areas. Efficient use of space is a major factor in this high-production operation.

LAST October, the Viking-Copper Tube Co., Cleveland, completed construction of its new plant. The product is copper tubing for the automotive and refrigeration industries, as well as for general industrial use. The mill receives the tubing in sizes ranging from 1¼"

FOUR PARALLEL DRAWING benches. Note system of racks; soap tank in foreground.



It's a SALESMAN'S Market!

E. E. Potter

Vice President
General Electric Co.

*(In an address at the 41st annual convention of
the National Electrical Wholesalers Association)*

IT SEEMS to be the fashion today to say that we are getting into a buyers' market. I don't agree.

I think that what we are really getting into is a salesman's market. From here on out there's going to be plenty of competition for most markets. And what is wrong with that? Keen competition is typically American—we have thrived on it.

We older salesmen remember when sales talks were verbal wrestling matches every day of the year. But we are apt to forget that there are thousands of young men who have only recently discovered that the primary function of a salesman is to sell goods. Is this bad? I don't think so.

In fact, we should begin to reeducate these youngsters who have never taken part in a competitive training program. We must teach them the know-how—not keep it to ourselves. We must attract them to our business of selling, and to our methods.

Statistics show that about 3,000,000 people reach working age every year. It is an obligation we should assume very gladly to teach youngsters that our way of life is the best that can be promoted and that they should be proud of the opportunity to follow in our footsteps and be counted as wanting more power for America and what it has stood for.

And, incidentally, while we are speaking of training, what about us old-timers doing a little orienting of ourselves to the conditions ahead? Are we as fit for the new problems in the new period of competition as we think we are?

I believe that more competition is going to be good for our whole economy. Anything which restricts competition beyond a certain point, over too long a period of time, is dangerous to our economy. In spite of the growing morass of government regulations and controls, we still have a highly competitive economy in this country. It is more competitive than most other contemporary economies, or than those of earlier times.

You distributors, wholesalers and contractors play a very important part in this scheme of things. You are good salesmen, and in the period ahead, America, and the world, is going to need good salesmen.

We have had too much controlling of men and the controlling of things and too little *persuading*, which in the last analysis is selling. But I think we all have a little more than a product to sell these days—let's say, a product plus—since by definition of our jobs the product must come first.

I believe, as most people, that this country faces great opportunities and great responsibilities in the next 10 to 20 years, but I also believe that whether we adequately live up to these opportunities and responsibilities depends, primarily, on how fully we are able to develop our business enterprise.

to 1 3/8" O.D., and draws the stock to sizes ranging from 1/8" to 1".

Stock Moves to Fabrication

The tubing is received in an adjoining large warehouse in 1500-lb. steel strapped bundles, with fibre-board strips between the vulnerable tubing and the steel banding. An overhead electric crane loads these lifts on wagons for delivery to the tube mill, where they arrive under the 50-foot span of a traveling bridge crane that runs the full length of the room. The stock is placed immediately by the crane in six-foot-high racks for temporary storage at the first fabrication station, the rotary pointer.

Initial pointing is necessary for the subsequent drawing operation. The stock is fed to the pointer or swedging machine from horses, where the lifts are spotted by the 5-ton crane serving this room. Because the height of the horses is approximately the same as that of the pointer, an easy sliding motion on the part of the machine operator suffices for feeding the stock. The pointed tubes are rolled off onto 38-inch-high racks. Wooden cross pieces separate the lifts of different lengths and provide clearance for insertion of the slings. The next station is the soap tank. At this point it will be well to give detailed attention to the layout of the mill as a whole.

Efficient Layout—Compact Space

The accompanying layout sketch shows all facilities. The tube mill proper is 50' x 140', while the adjoining packing and finishing room is 20' x 140'. Two doorways were provided for inter-departmental travel.

The flow of the lifts through the area illustrates how properly considered layout makes for short moves and smooth handling of long lengths in a relatively compact space. Note, for example, that the receiving area for the tubing is within a few feet of the rotary pointer. The soap tank, the station

(Turn to page 66)



ALL CLEAR!
—from front to rear

every handling job is easier with **TOWMOTOR MH!**



NO HANG-UP ON "HUMPS"
—another Towmotor
efficiency feature

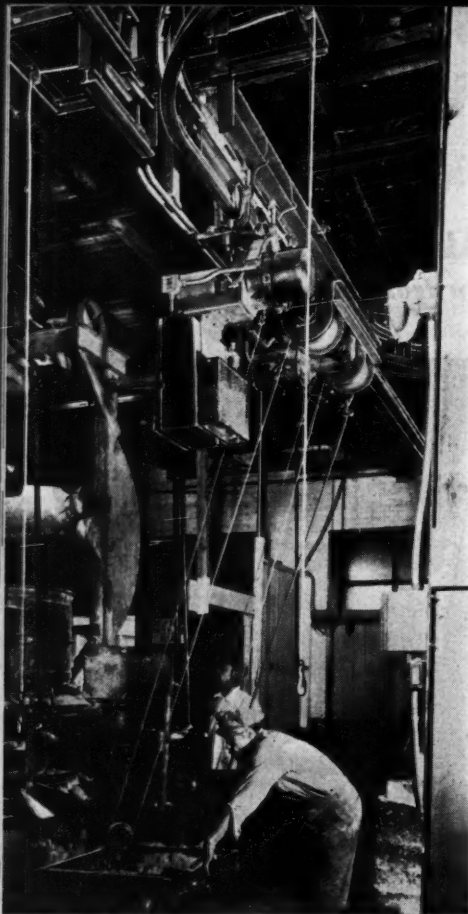
Towmotor provides plenty of under-clearance to avoid "hanging up" on the steepest ramps or roughest, bumpiest surfaces. Move loads where you please —with safety!

With ample under-clearance ranging from 5" to 10½", Towmotor's complete line of fork lift trucks assures "all clear" performance on difficult handling jobs. This safe under-clearance at center prevents any danger of scraping on ramps, high door sills, railroad tracks or other obstacles. That's just another reason why sturdy, agile Towmotors get the job done in less time, at less cost. Compare Towmotor with any other lift truck and you will see why Towmotor's practical features make every **Mass Handling** job easier, faster, safer. 10 models plus standard and specially designed accessories handle loads from 1500 to 15,000 lbs.—a Towmotor for every job. Write for a copy of the "Operators Guide." Towmotor Corporation, Division 8, 1226 E. 152nd St., Cleveland 10, Ohio. Representatives in all Principal Cities in the U. S. and Canada.



**FORK LIFT TRUCKS
and TRACTORS**

R E C E I V I N G • P R O C E S S I N G • S T O R A G E • D I S T R I B U T I O N



OPERATOR ROLLS caster-mounted bucket beneath muller to receive load of sand. It is then hoisted and dispatched to desired station.

AUTOMATIC DISPATCH SYSTEM FOR CORE SAND

The Forest City Foundry Co., Cleveland, installed an automatic monorail dispatch system to supply coremakers with sand. It delivers approximately 75 to 80 batches, or 25 tons, during an eight-hour day. Manual handling, congestion, and much non-productive time have been eliminated.

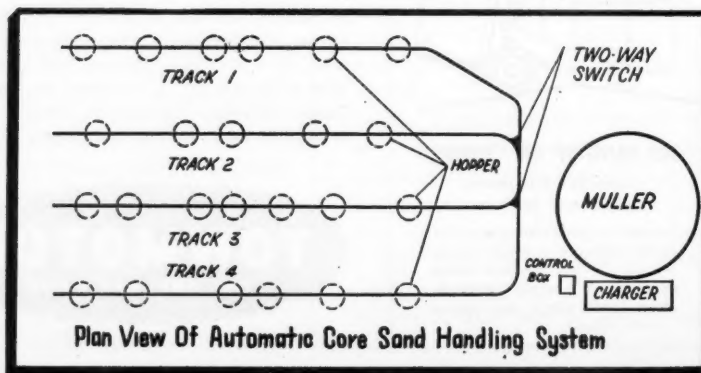
A LITTLE more than a year ago, all sand was delivered to the coremakers' benches by a fleet of wheelbarrows. The sand was picked up at a central location, wheeled to one of the stations, and the loaded barrow was left in the aisle. The coremaker would then shovel it onto his bench. This repetitive incidental handling caused considerable productive time loss. Also, the

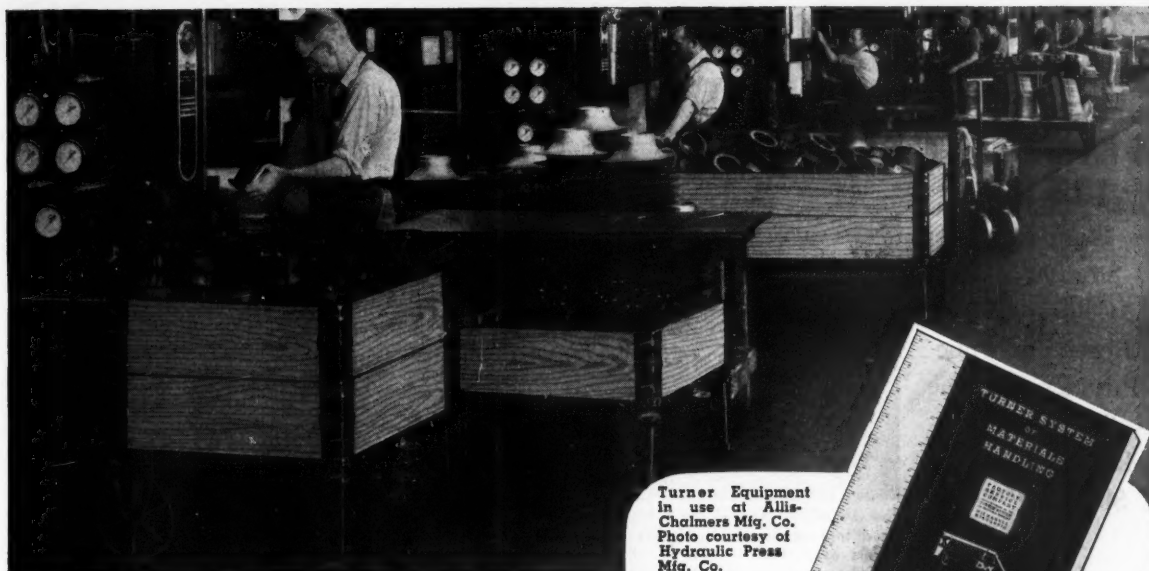
congestion from moving wheelbarrows in the aisles impeded production.

Since the installation of the automatic monorail dispatch unit in May of 1948, the company has eliminated all of these handicaps.

One man is usually able to serve 24 coremakers (another man sometimes aids in the work when the demand requires it). From a central point, he is able to load the muller, mix and discharge the sand and send it to the designated core-

THE ROUTES which the automatic dispatch unit travels in serving 24 coremakers.





Turner Equipment
in use at Allis-
Chalmers Mfg. Co.
Photo courtesy of
Hydraulic Press
Mfg. Co.



The TWO MINUTES

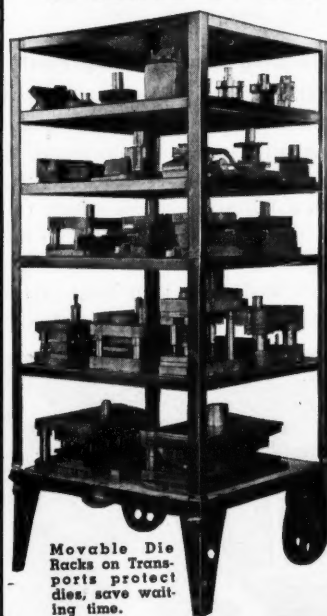
It takes to Send for this Book →

May Save You
HUNDREDS OF MAN HOURS!

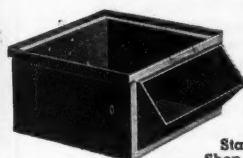
Get the Facts on
**THE TURNER SYSTEM
OF MATERIALS HANDLING**

For thirty years the Turner System has helped leading firms to save up to 50% in LABOR, FLOOR SPACE and EQUIPMENT. The chances are that it can save BIG MONEY in YOUR plant.

Write today for FREE BOOK completely describing the Turner System.



Movable Die
Racks on Trans-
ports protect
dies, save wait-
ing time.

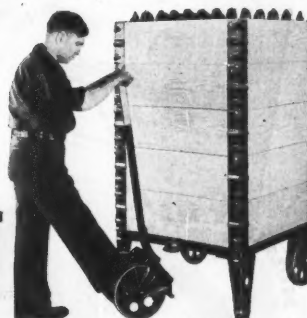


Open End (left)



Closed End (right)

Stacking
Shop Boxes.



"DELIVER THE BIN AND SAVE THE
HANDLING"



Rugged Turner Pallets save
money — three types.



Skid, same height as
Turner Transport.

Prove Savings

in your own plant without cost for equipment. Ask for details of our 60 DAY FREE TRIAL.

FACTORY SERVICE COMPANY

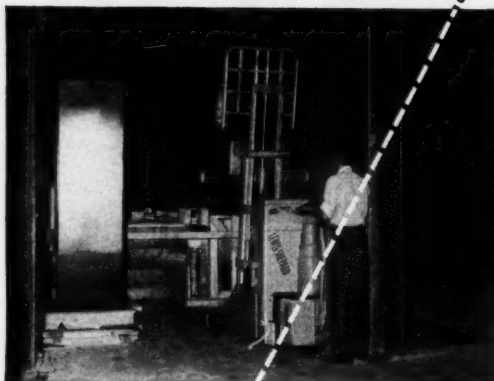
4607 NORTH TWENTY-FIRST STREET

MILWAUKEE 9, WISCONSIN

"MASTER" LINE BUYING... IS STRAIGHT LINE THINKING

SAVES YOU MONEY

Floor Space
Storage Space
Ceiling Space
Receiving Time
Production Time
Storage Time
Maintenance Time
Shipping Time
and pays
for itself
in "Jig Time"



The JACKSTACKER — At a flick of a switch in the handle head this combined electric lift truck and stacker lifts and lowers as it hauls — fits in where heavy fork trucks fail. 5 different models, telescopic and non-telescopic. Caps. to 4000 lbs. Photo shows Counterbalanced, Tilting Model, 3000 lbs. cap. in freight car. Hundreds of other cost-cutting uses for this latest unit in the "MASTER" Line.

LEWIS-SHEPARD

MATERIALS HANDLING EQUIPMENT

"Engineered to Save You Money"



Volume Off? Costs up? Competition Swift? What to do? . . . Lick them with the "Master" Line! Multiply your manpower, storage space, floor space! Speed up receiving, production, storing and shipping!

CUT COSTS WITH The "MASTER" Line

SPACEMASTER Electric Trucks
SPACEMASTER Gas Trucks
(Fork Types)
MASTER JACKSTACKERS
JACKLIFT ELECTRIC Trucks
MASTER JACKTRACTORS
MASTER JACKLIFT Trucks
MASTER QUICKLIFT Trucks
MASTER REDILIFT Trucks
MASTER SPEEDLIFT Trucks
POWERMASTER Stackers
SPEEDMASTER Stackers
FLOORMASTER Trucks
SHIPMASTER All-Steel
2-Wheel Trucks
WELDMASTER Platforms
LOADMASTER Racks

USE
COUPON
OR WRITE US
TODAY

LEWIS-SHEPARD PRODUCTS INC.

115 Walnut St., Watertown 72, Mass.
Midwest Plant: Crawfordsville, Ind.
Representatives in Principal Cities.

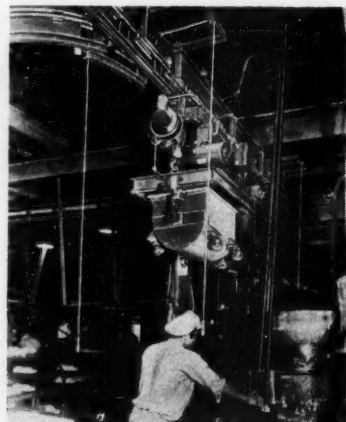
Name

Firm

Address

PLEASE SEND ME your
new 16 page Bulletin on
the two latest units in the
"Master" Line.

maker. Upon the monorail carrier's return the cycle is initiated again. (A description of automatic dis-



OPERATOR ACTUATES control box. Unit travels to designated station, returns automatically.

patch carriers will be found in Part II of the monorail survey article, FLOW, December, 1948.)

Vibrating Conveyor, Skip Hoist

Sand is brought to the plant by truck and unloaded in a storage room adjacent to the coremaking area. The sand feeds by gravity onto a vibrating screen which riddles the material, thence to an underground vibrating conveyor which feeds to a skip hoist in the next room. The operator actuates



BUCKET STOPS and discharges load. Overhead handling has eliminated floor congestion.

a switch, and the sand is raised and discharged into the muller, or mixer.

Oil binder is piped into the muller from an overhead tank. A third

(Turn to page 88)



A regular feature designed to help the engineer and others responsible for material handling. The FLOW Engineering Data Page will cover a different category of equipment each month.

DETERMINING CASTER COMBINATIONS

(From the 1949-50 FLOW Directory of Material Handling Equipment, Machinery and Accessories)

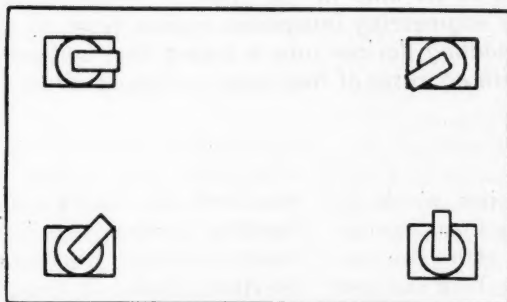
Several basic combinations of rigid and swivel casters are used in the design of industrial trucks. The choice of "truck design" will depend upon the size, type and weight of material to be moved, and the distance and the conditions under which the truck will be moved.

It is necessary to weigh the relative importance of maneuverability in close quarters against "steerability" in moving long distances.

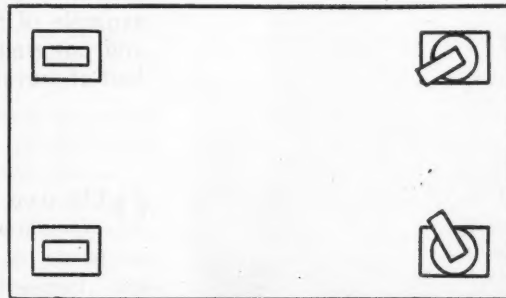
Careful consideration should be given to the use of tilt-style

mountings to make certain that the center load wheels have adequate load capacity. In this style of truck over 75% of the load is carried by the two center wheels. It is good economy to "over-caster" the center units.

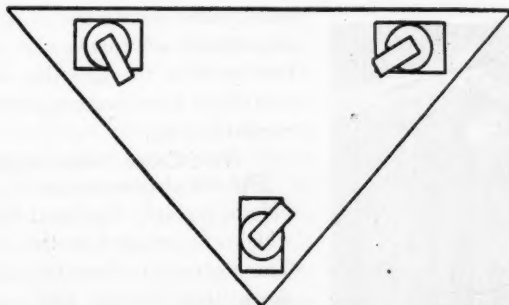
The "tilt" in tilt-style trucks is provided by bolstering or "shimming up" the center casters, or by using a rigid caster with a larger diameter wheel than the end casters. Standard practice in determining the amount of tilt is to allow $\frac{1}{8}$ " additional height of the center casters for each 12" of truck length.



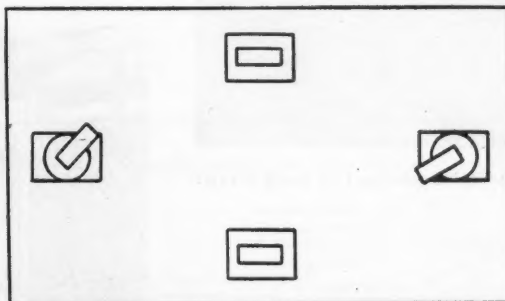
Four swivel casters, level type. Permits truck to be maneuvered in close quarters. Used on trucks and portable equipment moving short distances.



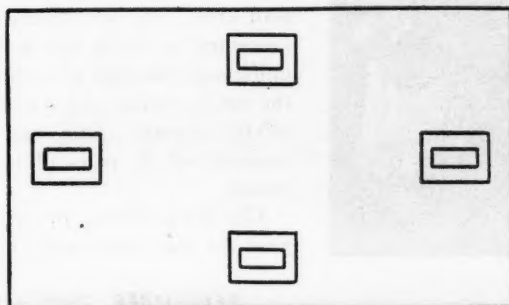
Two swivel and two rigid casters, level type. Easily steered over long distances. Regularly used on all types of portable equipment.



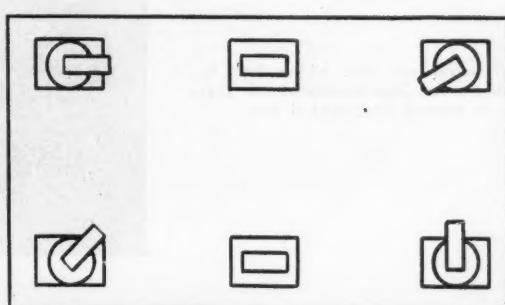
Three swivel casters, level type. Used on barrel dollies and small portable machines . . . three-point floor contact.



Two swivel and two rigid casters, tilt type. Maximum maneuverability . . . will turn in its own length.



Four rigid casters, tilt type. Limited to light loads.



Four swivel casters and two rigid casters, tilt type. Equally as

PART I

HOW THE

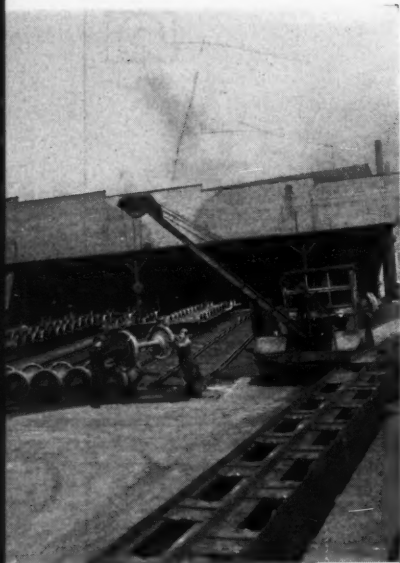


KEEPS THE WHEELS RO

By **C. A. KOTHE**
Shop Superintendent
Erie Railroad, Meadville, Pa.

Mounted crane, electric hoists, 2-wheel hand trucks, monorail dispatch system, gravity racks, chutes.

The wheel shop of the Erie Railroad has been converted from a quarter section of a former roundhouse into one of the most productive plants of its kind in the country. This outstanding example of flow engineering integrates various types of gravity and powered handling devices into a layout that utilizes every foot of travel with no waste of floor area or human effort.



YARD CRANE unloading from special flat cars.

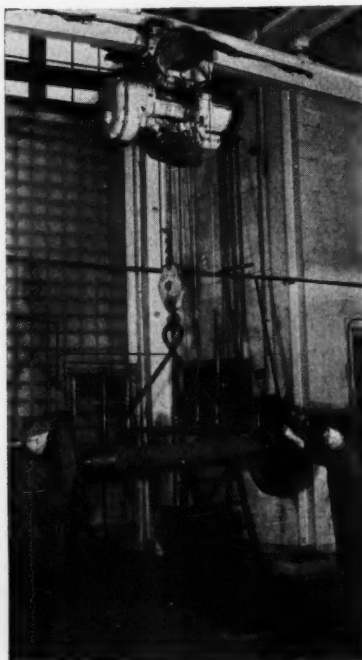
OUR shop receives wheels for reconditioning from distributing points on the entire Erie system. Included are both cast iron and steel wheels (from various types of rolling stock), though the major portion of this description

deals with cast iron wheels. The handling functions described pertain to unloading, demounting, inspection, disposal of scrap, cleaning, testing, and, after various machining operations, mounting of cast iron wheels, and shipping. This first part of the discussion traces the flow to the point of scrap disposal, while next month's concluding article will present a typical flow pattern through the shop of units that have been approved for reconditioning.

Yard Crane, Yard Layout

The wheel pairs arrive in Meadville in specially equipped flat cars, which are assigned to this service. These cars have four 12" channels down their length, two on each side, which are slotted to nest the wheels. The slots are staggered, an arrangement which overlaps the wheels, thus utilizing the maximum load area. The slots make it unnecessary to block the individual units; only the pair at each end of the car is secured with a chain as a safety measure. Each car has a capacity of 21 pairs of mounted wheels.

The track flanks the receiving yard on the south end, where a



HOIST moves axle with wheels from demounting press. Counterweighted axle buggy is shown in foreground of view.

SROLLING

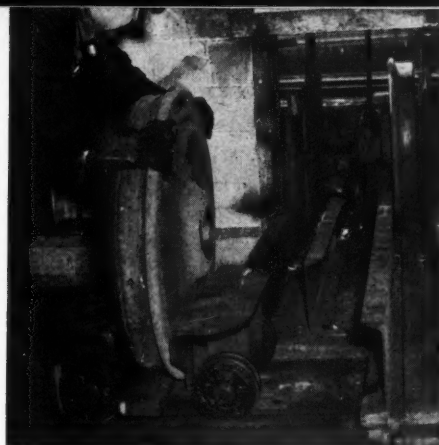
pneumatically tired crane is spotted for unloading. The wheels are lifted off the cars with a specially designed spreader beam whose hooks fit the inside of the flanges. The load is placed on a turntable (across a paved driveway from the track), where two operators spot the wheels. One hook-on man is on the flat car.

The track on the turntable is a tilting section. It is raised pneumatically 12" at the heel, automatically activated by the weight of load, to give the wheels the initial push to the north end of the 100-ft. long distribution track, which runs at right angles to seven parallel tracks that lead to the shop.

At the north end the cast iron wheels arrive on a second turntable, also pneumatically operated, which is actuated automatically through interlocking switches. As the wheels roll onto it, they depress a tripper which actuates a pneumatic timing mechanism. After 15 seconds the table turns 90 degrees to the left and its track section is lined up with the "incoming" track. After a 10-second interval the turntable track tilts to discharge the wheels onto the track that leads through a doorway to the demounting press just inside the shop. The timing mechanism returns the turntable after 15 seconds to the original position, when it is again lined up with the south-north track to receive the next pair of wheels.

If wheel pairs have to be sent

YARD LAYOUT, with track system and turntables which serves for incoming and outgoing wheels.

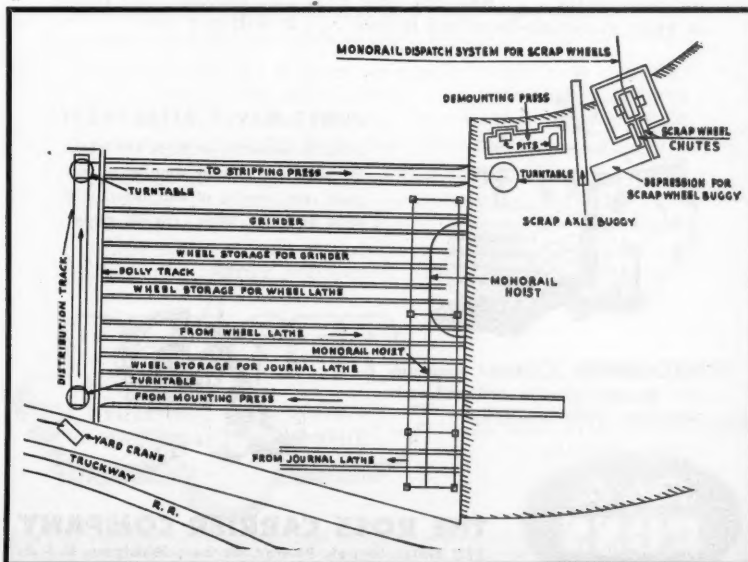


BUGGY is lined up with chute for shunting left wheel into automatic monorail carrier outside building.

to any track not connected to either of the two turntables, a transfer dolly is used which runs on a narrow-gauge track the length of the storage yard.

As can be seen from the accompanying flow diagram, the ingoing track is at the north end of the yard, the outgoing track at the south, both connected by the turntables and the lateral distribution track. This arrangement permits the same location to be used for either unloading or loading, which is done in a continuous operation during the busy season. That is to say, as soon as one car has been

AUTOMATIC CARRIER raises with wheels from pit adjoining loading chute. See photos on pages 64, 65.





*Enterprise Wheel & Car Corporation, Bristol, Virginia

... they're a "SNAP" with ROSS lift trucks

Big, bulky loads can cause increased handling costs. But at Enterprise Wheel & Car Corporation such costs have been greatly reduced by a ROSS Lift Truck. It handles raw materials in 5-ton loads . . . sub-assemblies and completed assemblies . . . loads out shipments. In addition, it efficiently augments the yard crane . . . Says Mr. F. A. Jones: "We find the ROSS exceptionally valuable in that we can now store shorter-length materials in our general storage yard. This releases space under the crane for the extremely long structurals and bars which the crane handles."

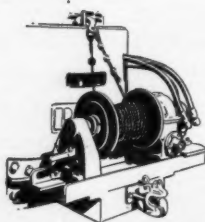
Investigate ROSS Lift Trucks (capacities 5,000 to 18,000 lbs.) for your plant . . . find out how they can become vital links in your materials-handling system . . . it will pay you.



ROSS CARRIERS . . . Speed transportation of long materials and unit-loads. Capacities, 10,000 to 30,000 lbs.

POWER-WINCH ATTACHMENT

Adds to versatility of ROSS Lift Trucks. Permits faster, easier spotting of railroad cars, moving of machinery, skidding of heavy loads. Fits all models.



Rely On
ROSS

THE ROSS CARRIER COMPANY

280 Miller Street, Benton Harbor, Michigan, U.S.A.
Direct Factory Branches and Distributors Throughout the World

unloaded, the yard crane stationed within reach of the "receiving" turntable can reload the same car with reconditioned wheels being fed to this point from the mounting press in the shop via the outgoing track. A car puller will shift the loaded car, then spot the next flat car with defective wheels within range of the yard crane.

Thus unloading and reloading of cars can proceed in an uninterrupted operation. No traveling or maneuvering is required on the part of the crane, and a minimum of time is consumed in spotting the cars. As long as the ingoing track is kept clear, wheels can be fed to the shop as fast as they come in. Once they have been dispatched from the first turntable they travel without further handling over two 100-ft. lengths of gravity track at right angles to each other (via the automatically operated turntable) and arrive inside the shop alongside the demounting press. (The capacity of this machine is approximately 25 pairs of wheels per hour, or a total of 400 wheels per 8-hour shift.) The three handlers plus the yard crane operator have unloaded up to 10 cars and reloaded nine more within an 8-hour day. When no wheels are scheduled, the yard crane is kept busy with scrap handling and other miscellaneous yard tasks.

Quick Scrap Disposal Aids Production Flow

Another feature can be observed from the flow sheet. All tracks leading into the shop are of the dual type, spaced six ins. from face to face in accordance with AAR regulations. This permits overlapping of wheels on alternate tracks about one ft. The six-inch spacing from face to face prevents the flanges from striking the axle or journal of the next pair. The dual-track arrangement increases storage capacity by about 30 per cent.

Since a considerable proportion of arriving cast iron wheels is scrapped, the layout provides for

the elimination of both scrap wheels and axles within a few feet from the powered door where these units enter the building. The material flow in the shops is thus not cluttered with scrap; only wheels and axles suitable for reconditioning remain in the shop.

The wheel and axle assemblies arrive on a turntable located in front of the demounting press, which is just inside the door. The wheel pair is turned 90 degrees and then rolled onto the low bed of the machine (the latter is curved to permit the axle to roll into position for demounting). The wheels are pressed off the seat but remain loosely on the journals.

The aisle to the front of the machine is served by a 5-ton hoist running on an I-beam track that extends for about 90 ft. at a height of 18 ft. above the floor. The hoist lifts the axle with the pressed off wheels out of the machine with the type of dual hook shown in one of the photos. The carrying surface of the two semi-circular hooks is covered with beads of wear-resistant weld metal, spaced one in. apart. These beads "roughen" the surface and thus prevent the axle from slipping or spinning while the load is suspended.

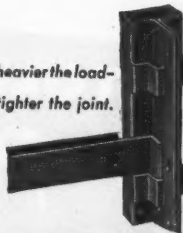
An inspector at the machine determines if the units coming off the press are (a) suitable for reconditioning, or if (b) any part should be reconditioned (as an axle), or if (c) both axle and wheels are to be disposed of for scrap.

Scrap Wheels Go Direct to Car

The hoist serving this aisle spots the right-hand wheel in one of the two chutes leading through a wall opening out of the building directly into the carrier of the automatic monorail dispatching system used for this purpose. The left-hand wheel, because of the width of the axle, is lowered into a wheel buggy, which is a wheel-mounted chute section with side walls of steel plate. After the wheels have been rested in buggy and chute, the axle is slipped out of the hubs and hoist-

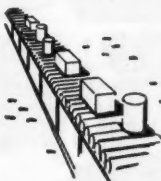
BERGER Wedge-Lock STEEL SHELVING

The heavier the load—
the tighter the joint.



HELPS SPEED STOCK ORDERS

On their way



● Stock moves out of storage and into production areas or sales floors *fast* when Wedge-Lock Shelving is teamed with your mobile materials handling equipment. Exclusive Berger Wedge-Lock construction forms tight, sway-proof joints without gussets or sway-braces. As a result, shelves are clear, open and easy to use ... free from obstructions which might impede materials movement.

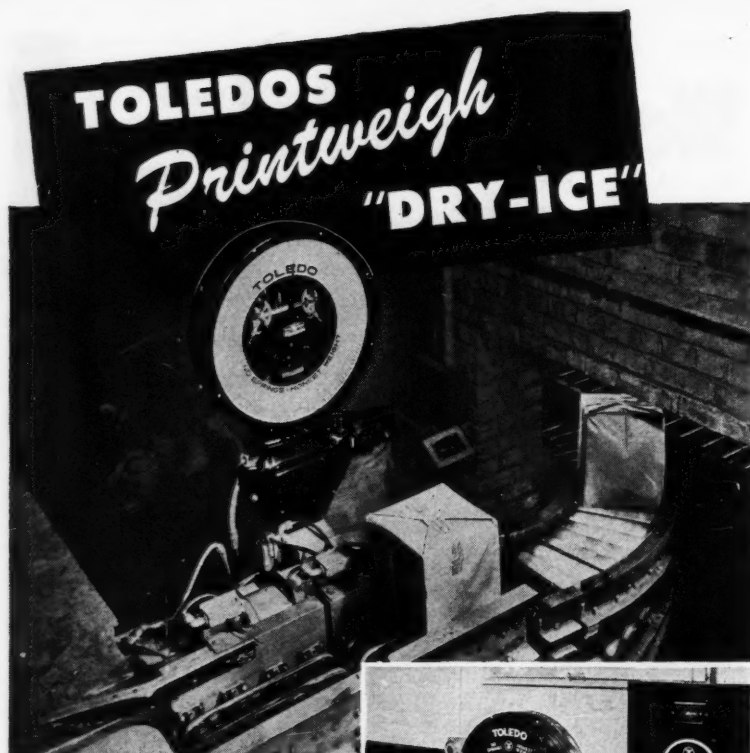
Because Wedge-Lock bears far greater weight than any other commercial-type shelving, it allows you to pack a lot of inventory in a minimum of space . . . saves you plenty of room for wide, unobstructed aisles that help traffic move fast.

Specify Berger Wedge-Lock Steel Shelving as an integral part of your materials movement program and cash in on a smooth, fast flow from stock room to sales floor . . . from receiving to production areas . . . from production to shipping. Write us for full information and for engineering assistance—without obligation.



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DIVISION
REPUBLIC STEEL CORPORATION
CANTON 5, OHIO**

Rack Type Steel Shelving for Long Parts • Steel Bar Racks • Convertible Steel Shelving • Flexi-Built Bin Units
Tool Room and Shop Equipment • Stacking, Nesting and Scoop Front Boxes • Steel Lockers • Steel Office Equipment



Accurate printed weights... with Toledo Printweigh Scales... control costs at key points in production of "DRY-ICE" at the Chicago plant of the Pure Carbonic, Incorporated.

Above is the Toledo Automatic Check-Weigher, which checks the weight of each block of packaged ice en route to loading dock. Accuracy here is vital as "DRY-ICE" is priced by weight. The Check-Weigher has a remote head with Printweigh (photo at right) conveniently located in shipping office. This Toledo prints the weight of the blocks on a continuous strip... keeps truck shipments straight!

Toledo Printweigh also provides an accurate printed record of the output of hydraulic presses which produce blocks of "DRY-ICE" four times the size of the packaged block (lower right). Keeps production records straight!

More and more today—modern plants look to Toledo all the way to provide the vitally important ACCOUNTING facts on receiving, shipping and production that mean accurate control of inventory, costs and profit! Send for bulletin 2020... a special presentation of Modern Weight Control.



TOLEDO SERVICE as near as your telephone... with factory-trained service men in more than 200 cities of United States and Canada.

Toledo Scale Company, Toledo 12, Ohio

TOLEDO

HEADQUARTERS FOR SCALES

ed out of the way. The loaded wheel buggy is lined up with the stationary part of the chute leading into the left compartment of the monorail carrier, and the wheel is then rolled out. (It is simpler to dispose of the left wheel by adjusting the empty buggy to the width of the axle than maneuvering the 5-ton hoist.)

The switch panel for the automatic monorail dispatching system is located on the wall adjoining the gravity chutes. The switch is lined up for a two-car station under the 110-ft. span of the monorail that parallels the building. Each car has four positions, designed for an even distribution of the load. Twenty trips are assigned to each of these four positions, which gives a total of 160 wheels per car (two being carried on each trip by the self-unloading monorail carrier). Each trip is marked on a tally board beside the control panel, and when 20 have been completed, the switch is set for the next station. In this way the cars are evenly loaded.

Self-Unloading Carrier

The following paragraph gives a brief example of how interconnected switches and relays control the automatic travel and return of the monorail carrier.

As the start button is pushed, the out relay picks up and holds its own circuit, and then contacts the station indicated as well as the up relay. After a time delay of five seconds the up relay closes, picks up the up relay contactor, and the latter starts the hoist motor. The motor runs until it hits an upper limit switch, opening the circuit of the up contactor. As soon as the loaded ascending carrier passes the limit switch, it closes the limit switch contact long enough to pick up the forward relay. Other relays and contacts are thus successively brought into play, while some are dropped out.

The trolley motor runs forward on the overhead track until it reaches the position on which the selector switch has been set. When

(Turn to page 64)



THE REACH
OF A GIRAFFE



THE STRENGTH
OF AN ELEPHANT



THE ENDURANCE
OF A CAMEL

HYSTER KARRY KRANE

TRY IT...

YOU'LL BUY IT...

Once a Karry Crane is in your plant or storage yard—**EARNING** for you—**CUTTING COSTS** for you—**LIFTING AND MOVING** all kinds of materials—you will wonder how the work was ever done **BEFORE**.

THOUSANDS OF KARRY KRANES ARE WORKING FOR HUNDREDS OF INDUSTRIES.

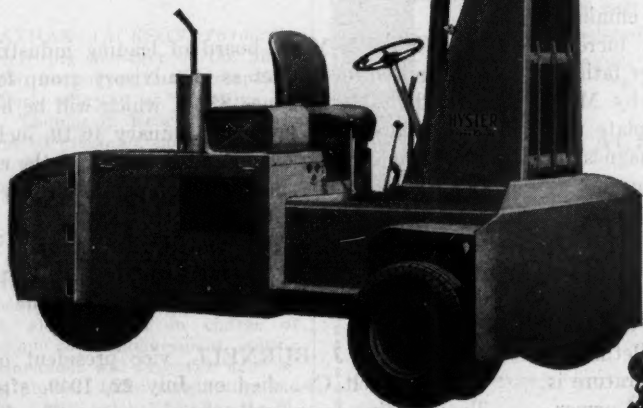
In some businesses it's a production mobile crane with regular materials handling jobs to do on schedule every day.

In other businesses, it's a utility, all-purpose, standby machine—able to go anywhere—ready to do any emergency or unusual moving job. Like good insurance—it's ready when you need it.

The Karry Crane is the **LOWEST PRICED**, 10,000-pound capacity mobile crane. It can do anything (within its capacity) that **ANY OVERHEAD OR STATIONARY CRANE OR HOIST CAN DO** and it can go anywhere to do it.

TRY IT and YOU'LL BUY IT. A demonstration in your plant—on your home grounds—will prove it to you. Your Hyster distributor is anxious to help you.

- ✓ Lowest priced 10,000-lb. capacity mobile crane.
- ✓ Pneumatic tires—works anywhere indoors or outdoors.
- ✓ Adjustable boom—5 positions.
- ✓ Trunnion steering for maximum maneuverability.
- ✓ Speeds up to 10 m.p.h. in either direction.
- ✓ Great for loading and unloading gondolas, flat cars, motor vans.



HYSTER COMPANY

THREE FACTORIES

2931 N. E. Clackamas ... Portland 8, Oregon
1831 North Adams St. Peoria 1, Illinois
1931 Meyers Street Danville, Illinois



ON THE



PALLET

NEWS • VIEWS • TRENDS

Ezra W. Clark

1881 - 1949

WORD was received at press-time of the sudden death of Ezra W. Clark, whose name has long been associated with the Material Handling Industry. Mr. Clark died of a heart attack, at the age of 68 in Battle Creek Michigan. He was vice president and general manager of the Clark Tractor Division, Clark Equipment Co., a position from which he retired in January, 1947. At that time he became a business counsellor and material handling consultant. He was one of the founders and a member of the committee of managers of the Material Handling Exposition. During World War I, he was an officer in the air corps, and in World War II, he made valuable contributions to material handling through research activities conducted in a civilian capacity in England prior to the European invasion. He joined the Clark Equipment Co. in 1918, and in 1927 was works manager and in charge of the sales of the industrial truck plant built in Battle Creek in 1920. He was elected to the board of directors in 1931, and was named plant manager in 1936. His final promotion came in 1943. Many material handling executives and engineers have benefited from his broad knowledge of industrial production and material handling. He was buried in Arlington National Cemetery.

NEW lightweight rugged magnesium grain shovels are ready to move America's bumper grain crop. Magnesium in this application is said to eliminate warping, splintering and rotting, and to increase production by decreasing weight and worker fatigue. The present grain shovel is manufactured by Magnesium Co. of America from magnesium plate and extrusion. A midwestern malt plant uses magnesium shovels to move grain out of bins during the malting process. Shovels for this work have to be strong and durable, as there is a terrific strain involved in moving the damp grain.

THE Power Crane and Shovel Association has published the very informative technical bulletin No. 2 entitled "Operating Cost Guide". The literature is published as a method of estimating cost of ownership and operation of power shovels, hoes, draglines, clamshells and cranes, $\frac{3}{8}$ to $2\frac{1}{2}$ cu. yds., $2\frac{1}{2}$ to 50

tons. Topics covered include fixed costs such as depreciation, interest, taxes, and insurance, repairs, maintenance and supplies; operation costs such as engine fuel and lubricating oil and labor; and other costs, for example indirect or overhead, supervision, etc. The literature is profusely illustrated with charts, graphs and line drawings. Various types of cranes are listed and with each, major costs are figured by percentage by the year and by the hour. Estimating forms are included for use in determining cost figures. The price of the 24-page booklet is 50 cents. The Association's address is 74 Trinity Place, New York 6, N.Y.

LEE S. MILLER has announced the incorporation of the American Pallet Co. with offices at 165 Broadway, New York City. The company's mill, located in Rome, Penn., has facilities for manufacturing expendable, box type, and standard pallets.

THE executive offices of The Electric Industrial Truck Association have been moved to the Beury Building, 3701 North Broad St., Philadelphia 40, Penna. The association formerly occupied offices at 29-28 41st Ave., Long Island City 1, N. Y. Its members manufacture some 90 per cent of the storage battery-powered industrial trucks, storage batteries and charging equipment produced in this country. William Van C. Brandt, for many years connected with the Electric Storage Battery Co., is the new managing director, secretary-treasurer of the association.

A FIFTEEN-MAN board of leading industrialists and editors to act as an advisory group for the first Plant Maintenance Show, which will be held in the Auditorium, Cleveland, January 16-19, inclusive, was announced by Clapp and Poliak, Inc., the exposition management. Some 50 companies already have reserved space and it is expected that several times that number will be represented when the show opens in January. The conference will be the first ever devoted exclusively to maintenance problems.

EDWARD J. BURNELL, vice president of the Link Belt Co., died on July 22, 1949, after an illness dating from earlier in the year. The funeral was held in Winnetka, Illinois, and burial was in Pennsylvania.

MEN IN THE NEWS

ALFONS ALVEN has been appointed General Sales Manager of Rollway Bearing Co., Inc., Syracuse, N. Y., according to a joint announcement made by W. B. Smithers, vice president and general manager of Rollway, and H. F. Hodgkins, president of Lipe-Rollway Corp., of which the Syracuse bearing plant is a subsidiary. Alven assumed his duties on July 15th. He was previously president of Bearings Co. of America, Lancaster, Pa. His entire business career has been connected with the anti-friction bearing industry.

H. W. OVERMAN announces his resignation as president and director of sales of the Unit Manufacturing Co., producers of aluminum "lifetime" hand trucks, effective immediately.

THE Baker Industrial Truck Division of The Baker-Raulang Co. has announced the appointment of John A. Matousek as manager of manufacturing. He will have charge of all manufacturing, purchasing and engineering functions. Matousek's experience of nearly 20 years covers his association

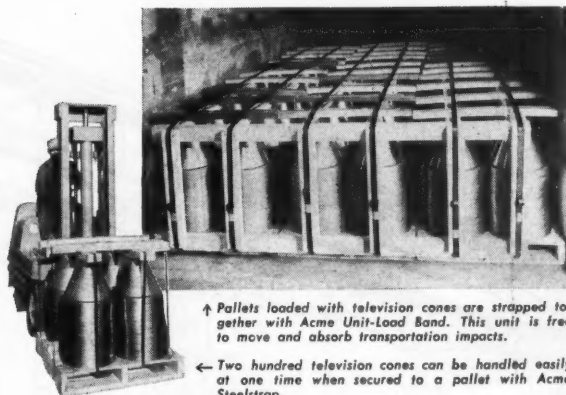


with Bohn Aluminum & Brass Corp., The Hupp Corp., Galanot Products Co., and the Cleveland Graphite Bronze Co. Other changes made by Baker are: E. H. Remde to adviser to the president on engineering and manufacturing; H. A. Schultz to the position of manufacturing engineer; and I. L. Young general superintendent.

JONATHAN JACKSON, formerly advertising manager of the Sisalkraft Co., has moved to the company's New York office in an executive capacity. Thomas E. Kearney, formerly assistant advertising manager, has been appointed advertising and sales promotion manager.

A. J. RINNANDER, formerly with the Chicago Pneumatic Tool Co., New York, has become a member of Harnischfeger Corp., Milwaukee. F. Salditt, vice-president in charge of sales, made the announcement, stating that Rinnander will supervise field activities, Zip-Lift Hoist distributors and sales on a national basis under the direction of E. W. Potratz, manager of the Hoist & Trav-Lift Crane Div., Milwaukee, Wisconsin.

Still another shipper cuts handling costs, damage claims with **ACME STEELSTRAP**



↑ Pallets loaded with television cones are strapped together with Acme Unit-Load Band. This unit is free to move and absorb transportation impacts.

← Two hundred television cones can be handled easily at one time when secured to a pallet with Acme Steelstrap.

T-V part-maker also cuts unloading time 92%!

The Milwaukee Metal Spinning Company, pioneer manufacturer of metal television cones, finds Acme Steelstrap and Unit-Load band the perfect shipping method for its easily damaged product.

The metal cones, strapped to pallets, are loaded into half of a railroad car. A gate is placed at each end of the grouped pallets, which become a "floating" unit when bound together with Acme Unit-Load bands. The other half of the car is loaded in the same way.

This dependable bracing method assures perfect delivery, and, under normal conditions, a car can be unloaded in 1½ man-hours. The old way of using wood braces required 18 man-hours for unloading.

More than 40,000 other users prove 9 out of 10 companies can ship safer . . . and at less cost . . . with Acme Steelstrap and Unit-Load band. Find out how you can save, too. Mail the coupon today.

STRAPPING DIVISION

ACME STEEL COMPANY

NEW YORK 17

ATLANTA

CHICAGO 8

LOS ANGELES 11

ACME STEEL COMPANY, Dept. F-99
2838 Archer Avenue, Chicago 8, Illinois

- ☐ Have representative call.
☐ Send booklet, "Savings in Shipping."

Name _____

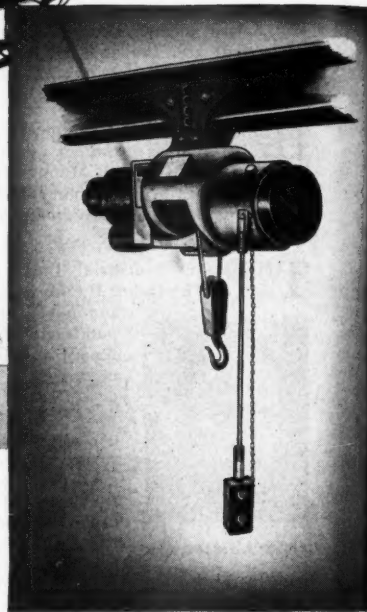
Company _____

Address _____

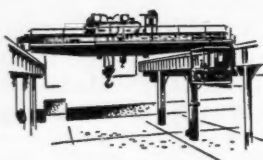
City _____ Zone _____ State _____

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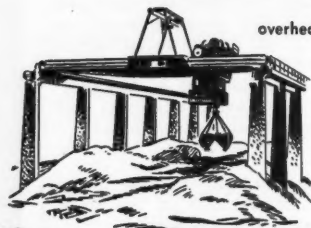
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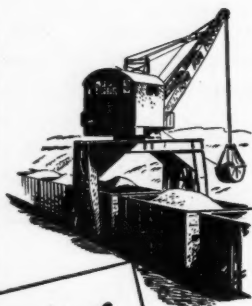
general-purpose crane



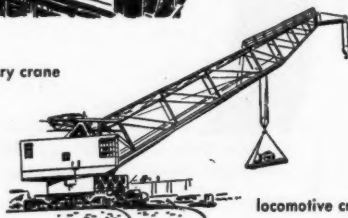
gantry crane



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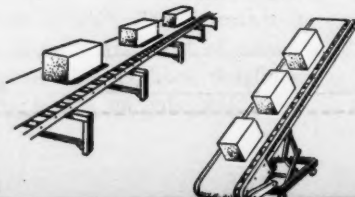
locomotive crane



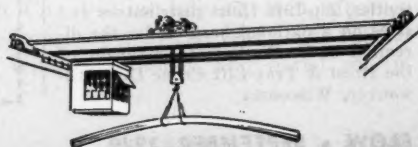
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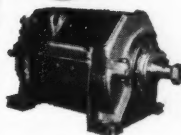
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Type MD 600 Motors for trolley, travel and hoist drive, are sturdy, dependable units, built for long life under tough conditions. Other d-c motor types are available to completely cover all crane applications.

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A-C CRANE & HOIST DRIVES



Tri-Clad Type MR slip-ring motors are widely used for driving cranes and hoists from a-c power supply. Types KR and KG high-torque squirrel-cage motors are available where constant speeds are satisfactory.

A-C Controls. General Electric offers both magnetic and manual control, Thrustor brakes, resistors, master, drum, and limit switches. Max-speed and other adjustable-voltage controls available for special jobs.



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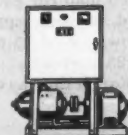
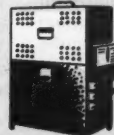
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HOIST DRIVES



INDUSTRIAL TRUCK DRIVES & BATTERY CHARGERS



Specifications on Electric Overhead Cranes (and general information) for Standard Service

PART II

THESE specifications (including general information) are released by the Electric Overhead Crane Institute, and were developed with a threefold purpose in mind: 1. To promote standardization by providing a basis for uniform quality and performance. 2. As an aid to purchasers of cranes, engineers and architects. 3. As a general guide for the manufacturer who, applying his engineering ingenuity, may want a basis for economical procedure. **NOTE:** The specifications and data given apply to standard

industrial service cranes for medium duty requirements. Examples are heavy machine shops and "medium" foundries, and fabricating and assembly plants. Excluded are such light-duty cranes which are used for infrequent service in power houses, as well as heavy-duty cranes employed for continuous service in steel mills and similar operations. The general nature of these data is helpful as a basis for arriving at conclusions, which may be checked with the individual manufacturer.

GIRDER SPECIFICATIONS

General

The crane girders shall be structural steel box section, riveted or welded; wide flange beams, standard "I" Beams, reinforced beams, or box sections fabricated with beams. The manufacturer shall specify the type and construction of the girders to be furnished.

The crane girders shall be designed in accordance with the design data given in the following paragraphs for the type of girder to be furnished. The girders shall be constructed in accordance with the best fabricating practice.

Loading

The combination of loads to be considered in the design of the girders for cranes operating indoors shall be the larger of:

- (a) The sum of the maximum stresses due to the dead load, the weight of the trolley, the rated load, and the impact allowance.
- (b) The sum of the maximum stresses due to the dead load, the weight of the trolley, the rated load, and an allowance for the lateral load due to acceleration and deceleration of the crane.

The impact load shall be considered as being equal to 0.5 percent of the rated load for each foot per minute full load hoisting speed, with a minimum allowance of 15 per cent and maximum of 25 percent.

For cranes having a full load bridge

speed between 300 and 400 feet per minute the allowance for lateral load due to acceleration or deceleration shall be considered as 5 per cent of the weight of the crane bridge, the trolley, and the rated load. When cranes have a full load bridge speed less than 300 feet per minute the allowance for lateral load may be reduced proportionately. The dead load shall be considered as a uniformly distributed load and the trolley and load shall be considered a concentrated load when calculating the lateral moment. The location of the trolley and load for lateral moment computation will be in the same position as used in calculating the vertical moment. The lateral moment shall be equally divided between the two girders and shall be considered as resisted by the entire girder section

MEMBER COMPANIES OF THE ELECTRIC OVERHEAD CRANE INSTITUTE

Alliance Machine Co., Alliance, Ohio; Bedford Foundry & Machine Co., Bedford, Ind.; Cleveland Crane & Engineering Co., Wickliffe, Ohio; Harnischfeger Corp., Milwaukee Wisc.; Morgan Engineering Co., Alliance, Ohio; Northern Engineering Works, Detroit, Mich.; Manning, Maxwell & Moore, Inc., Shaw Box Crane and Hoist Div., Muskegon, Mich.; Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.; Whiting Corp., Harvey, Ill.

about its vertical axis.

When cranes operate outdoors the same combination of loads shall be considered and in addition consideration shall be given to a wind load of 30 pounds per square foot acting against the projected horizontal area of the crane exclusive of the operator's cab, if located at one end. The stress due to the wind load shall be added to those caused by the dead load and the weight of the trolley only. Only those stresses due to wind load will be considered which are in excess of 25% of other combined stresses.

Deflection:

The maximum vertical deflection of the girder, produced by the dead load, the weight of the trolley, and the rated load, shall not exceed .00125 inches per inch of span. Impact shall not be considered in determining deflection.

Box Girders Welded Type

Girders shall be fabricated of steel plates with continuous welds running the full length of the cover plates. The fillet weld in the flanges will be continuous and ample to develop the section for maximum shear and bending.

The girders shall be designed according to the following data:

I/b shall not exceed 55

b/c shall not exceed 60

h/t shall not exceed 240 (except when horizontal web stiffeners are used).

I = Span in inches.

b = Distance between web plates in inches.

c = Thickness of cover plate in inches.

d = Distance outside to outside of web in inches.

h = Depth of web in inches.

t = Thickness of web in inches.

The maximum fibre stresses with combined loading shall not exceed:

Tension (net section)—16,000 psi.

Compression—16,000 psi or when b/c exceeds 41 the compressive stress in the top flange shall be reduced as follows:

$$b/c = 43 \quad fc = 15000$$

$$b/c = 46 \quad fc = 13000$$

$$b/c = 50 \quad fc = 11000$$

$$b/c = 55 \quad fc = 9000$$

$$b/c = 60 \quad fc = 7000$$

SHEAR—The maximum shear on the gross area of the web plates shall not exceed 12,000 psi. When h/t exceeds 60 the allowable shearing stress in the webs shall not exceed 18000

$$\frac{1 + h^2}{7200t^2}$$

When h/t exceeds 60 the maximum distance between full depth diaphragms shall not exceed h/t in inches. In no case shall the distance between full depth diaphragms be greater than 6'0".

Full depth diaphragms or stiffeners shall be furnished at motor supports and line shaft bearings. Short diaphragms shall be furnished where required to transmit the trolley load to the web plates. All diaphragms shall bear against the top cover plate, or be welded to it. Girders shall be cambered an amount equal to the dead load deflection plus one-half the live load deflection.

Box Girders Riveted Type

Girders shall be fabricated of steel plates and angles with riveted chord construction. Diaphragms and splices shall be riveted or welded. Riveted or welded connections shall be designed for the full strength of the material. Where possible, all rivets shall be machine driven.

The girders shall be designed according to the following data:

l/b shall not exceed 65.

h/t shall not exceed 240 (except when horizontal stiffeners are used).

w/c shall not exceed 60.

L = Span in inches.

b = Distance between web plates in inches.

c = Thickness of cover plate in inches.

h = Clear depth of web in inches (distance from toe to toe of the vertical legs of flange angles).

t = Thickness of web in inches.

w = Width between top flange rivets in inches.

The maximum fibre stresses with combined loading shall not exceed:

Tension (net section)—16,000 psi.

Compression—16,000 psi or when w/c exceeds 41 the compressive stress

in the top flange shall be reduced as follows:

$$w/c = 43: \text{-----} fc = 15000.$$

$$w/c = 46: \text{-----} fc = 13000.$$

$$w/c = 50: \text{-----} fc = 11000.$$

$$w/c = 52: \text{-----} fc = 10000.$$

$$w/c = 55: \text{-----} fc = 9000.$$

$$w/c = 60: \text{-----} fc = 7000.$$

SHEAR—The maximum shear on the gross area of the web plates shall not exceed 12000 psi. When h/t exceeds 60 the allowable shearing stress in the webs shall not exceed 18000

$$\frac{1 + h^2}{7200t^2}$$

When h/t exceeds 60, the maximum distance between full depth diaphragms shall be wide flange beams, standard I case shall the distance between full depth diaphragms be greater than 6'0".

Full depth diaphragms or stiffeners shall be furnished at motor supports and line shaft bearings. Short diaphragms shall be furnished where required to transmit the trolley wheel load to the web plates. All diaphragms shall bear against the top cover plate, or be welded to it. Girders shall be cambered an amount equal to the dead load deflection plus one half the live load deflection.

Beam Girders

The girders for beam type cranes shall be wide flange beams, standard I beams, or beams reinforced with plate, angles, or channels. An auxiliary girder or truss shall be provided parallel to the drive mechanism, cab, and foot-walk.

The maximum fibre stresses with combined loading shall not exceed:

Tension (net section)—16000 psi

Compression—12,000.00 with maximum of 16000 psi

$$\frac{Ld}{bt}$$

Shear—12000 psi maximum

L = span in inches

b = width of compression flange

t = thickness of compression flange

d = depth of beam

Beam Box Girders

Box section girders built up of two beams, either with or without reinforcing flange plates, shall be designed according to the same design data as for beam girder cranes. The auxiliary girder or truss may be omitted where the girder is sufficiently rigid to resist the twisting due to the bridge drive mechanism, etc.

ELECTRICAL SPECIFICATIONS

General

The crane manufacturer shall furnish all electrical equipment on the crane including motors and control equipment. The installation shall be made in a workmanlike manner and in accordance with the requirements of Article 610 of the latest issue of the National Electrical Code. The crane

manufacturer shall state in his proposal the make, type, style, and rating of the motor to be furnished. The crane manufacturer shall state whether the controllers to be furnished for each motion are manual or magnetic type and give the make and specifications of such equipment.

The electrical equipment shall, unless otherwise specified, be in accordance with the following detailed specifications.

Motors—Alternating Current

The motors shall be provided with anti-friction bearings and rated 30 minutes 50°C for open motors and 30 minutes 55°C for enclosed motors. The crane manufacturer shall specify whether open or enclosed motors are to be furnished. Motor sizes and horsepower shall be established by the crane manufacturer.

Motors—Direct Current

The motors shall be provided with anti-friction bearings and rated 30 minutes 55°C. Motors shall be totally enclosed type. Motor sizes and horsepower shall be established by the crane manufacturer.

Hoist Motor Brake—Alternating Current

The hoist motor electric brake shall be of the shoe or disc type, electrically released. The rated torque of the brake shall be not less than the full load torque of the motor. The brake mechanism should be so designed as to provide a minimum of adjustment and provide equal clearance as well as pressure on both shoes.

Hoist Motor Brake—Direct Current

The hoist motor electric brake shall be of the shoe or disc type, electrically released. The rated torque of the brake shall be not less than the full load torque of the motor. The brake mechanism should be so designed as to provide a minimum of adjustment and provide equal clearance as well as pressure on both shoes.

Manual Controllers—Alternating Current

The controllers should provide at least 4 steps of speed regulation in each direction of operation with a minimum of 5 steps for motors over 10 horsepower. They should be equipped with a suitable device to indicate definitely the "off" position of the controller. All controllers shall provide an increase in speed when operating toward the "on" position and a decrease in speed when operating toward the "off" position.

Manual Controllers—Direct Current

The controllers should provide at least 4 steps of speed regulation in each direction of operation with a minimum of 5 steps for motors over 10 horsepower. They should be equipped with a suitable device to indicate definitely the "off" position of the controller. All controllers shall provide an increase in speed when operating toward the "on"



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position and a decrease in speed when
operating toward the "off" position.
Dynamic lowering shall be provided for
the hoist motor when so specified by
the crane manufacturer.

Magnetic Controllers—Alternating Current

When magnetic control is furnished
for any motion of the crane, the crane
manufacturer shall mount the mag-
netic panel on the crane footwalk or in
the operator's cab. Magnetic panels
shall be open or enclosed type depend-
ent on conditions. The crane manufac-
turer shall state whether panels are
open or enclosed and the type of en-
closure if furnished. The accelerating
contactors should be provided with
definite time or current relays to pro-
tect the motors from too rapid accel-
eration. Contactors shall be of ample
capacity for the horsepower and cur-
rent requirements.

The magnetic panels shall provide at
least 5 points of acceleration with a
minimum of 3 points being manually
controlled by the master switch. The
master switches should be equipped
with a suitable device to indicate defi-
nitely the "off" position of the con-
troller. All controllers shall provide
an increase in speed when operating
toward the "on" position and a de-
crease in speed when operating toward
the "off" position. Electrical control
circuit braking or dynamic lowering
may be provided when recommended
by the crane manufacturer.

Magnetic Controllers—Direct Current

When magnetic control is furnished
for any motion of the crane, the crane
manufacturer shall mount the mag-
netic panel on the crane footwalk or in
the operator's cab. Magnetic panels
shall be open or enclosed type depend-
ent on conditions. The crane manufac-

turer shall state whether panels are open or enclosed and the type of enclosure if furnished. The accelerating contactors should be provided with definite time or current relays to protect the motors from too rapid acceleration. Contactors shall be of ample capacity for the horsepower and current requirements.

The magnetic panels shall provide at least 5 points of acceleration with a minimum of 3 points being manually controlled by the master switch. The master switches should be equipped with a suitable device to indicate definitely the "off" position. Electrical control circuit braking or dynamic lowering may be provided when recommended by the crane manufacturer.

Resistors

The resistors should be cast grid type or equal. They shall not be less than NEMA 152 or 153 classification. The thermal rating of the resistors should take into consideration the size of motors as well as the length of time the resistors are in the circuit. The resistors shall be securely mounted and shall be protected.

Protective Panel

A suitable crane protective panel or other means of overload protection for each motor circuit shall be furnished. When magnetic controllers are furnished protection may be furnished on the individual magnetic panels.

The crane protective panel shall be provided with a safety enclosure and shall have an externally operated knife switch capable of being locked in the open position.

Hoist Limit Switch

The hoist limit switch shall be so designed that when the hoist block reaches its upper limit of travel the hoist limit switch will either directly, or indirectly through a magnetic contactor or other device, interrupt the current to the hoist motor in the hoisting direction and allow the hoist motor brake to set. The limit switch shall be connected in the circuit in such a manner that it will be possible to lower the hoist block by reversing the controller into the lowering position. The crane manufacturer shall specify the type and design of limit switch to be furnished.

Crane Wiring

The crane shall be wired in accordance with the requirements of Article 610 of the latest issue of the National Electrical Code. Wire sizes shall be based on the requirements for 30 minute rating motors.

Bridge Conductors

The current conductors across the bridge shall be hard drawn bare copper wires, steel angles, or such other type as specified. The crane manufacturer shall state the type of conductors to be furnished. The conductors shall be properly supported and insulated in ac-

This Crescent *raises profits for Lucas Paints*

Here is the truck—the only truck built to stack from narrow aisles. The Crescent AISLE SAVER increases storage space while it lowers handling costs at the John Lucas Company, Gibbsboro, N. J. Slipping in and out of confined areas, the AISLE SAVER tiers loads to ceiling height. It eases and speeds loading and unloading of carriers. One operator, instead of a crew, does the entire job of lifting, hauling and stacking.

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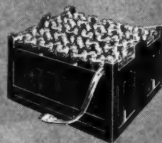
If so, now is the time to become acquainted with long-life EDISON Nickel-Iron-Alkaline Storage Batteries . . . the batteries that give you real dollar economy. Did you know they're electrically foolproof—require no critical adjustment of charge rates—can't be injured by reverse charging, short circuiting or similar electrical accidents? Did you know they're built of rugged steel inside and out to withstand rough usage? Did you know EDISON Service Engineers check your batteries regularly and help you to maintain them in top condition?

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cordance with Article 610 of the latest issue of the National Electrical Code.

Current Collectors

Trolley and main line current collectors shall be provided to suit the type of conductors used and shall be designed to provide adequate power supply to the crane. The trolley collectors shall be so constructed that they will be easily removable for replacement. The main line collectors should be so located that they will be accessible for replacement.

SAMPLE SPECIFICATIONS

The crane manufacturer shall furnish (one) (10) ton rated capacity (3) motor overhead electric traveling crane in accordance with Specification 49 of the Electric Overhead Crane Institute. Any exceptions to these specifications shall be clearly stated.

The crane span, center to center of runway rails, shall be (70'-6"), the hook lift (25'-0"). Electrical equipment shall be furnished for (230 Volt DC) or (220 Volt 3 phase 60 cycle AC) current. The crane manufacturer shall specify the make and type of motors, controllers, and other electrical equipment included in his proposal.

The crane shall be constructed to operate on a runway (300) feet long, in a building with the following clearances. Floor to top of runway rail (24'-6"), top of runway rail to nearest overhead obstruction (6'-8"), center of rail to nearest side obstruction (12"). The runway rail will be (60) lbs. ASCE. The required hook lift from the floor to the hook in its highest position is (22'-0").

The crane manufacturer shall specifically state in his proposal the type of girders, end trucks, wheels, bearings, footwalk, and bridge conductors to be furnished.

The operating speeds of the crane with rated load shall be as follows:

Main Hoist—(30) FPM
Aux. Hoist—() FPM when used
Bridge Travel—(300) FPM
Trolley Travel—(125) FPM

Any exceptions to these speeds shall be stated. The crane manufacturer shall specify the horsepower ratings of the motors to be furnished.

The crane will operate (8) hours per day. The average load lifted will be (7) tons. It will be used to handle (machine assemblies).

NOTES

- 1.) The data included in brackets () is sample data only and should be filled in according to the purchaser's requirements.
- 2.) When an auxiliary hoist is required the rated capacity required should be clearly stated.
- 3.) Where the purchaser has a preference for specific types of motors, controllers, girders, end trucks, wheels, bearings, etc., complete information should be added to his specifications.
- 4.) This specification covers a standard

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cab operated crane operating indoors under usual conditions. If the crane is to operate outdoors, or under special conditions of excessive dust, moisture, fumes, etc., it should be clearly specified.

- 5.) If conditions are such that double hook, double trolley, or other special requirements, are necessary complete information should be furnished.

- 6.) This specification covers the crane only F. O. B. the manufacturer's plant and does not include any part of the runway, runway rails, or runway conductors.

Appendix "A"

Suggested Runway Rail Size	
Maximum Wheel Load	Rail Size
LBS	
20,000	40#
40,000	60#
70,000	80#
90,000	100#

Capacity	Hoist*	Bridge	Trolley*
5	20-50	300	125-150
7½	20-45	300	125-150
10	20-40	300	125-150
15	15-30	300	125-150
20	12-25	300	100-150
25	12-25	300	100-150
30	12-20	250	100-150
40	10-15	250	100-125

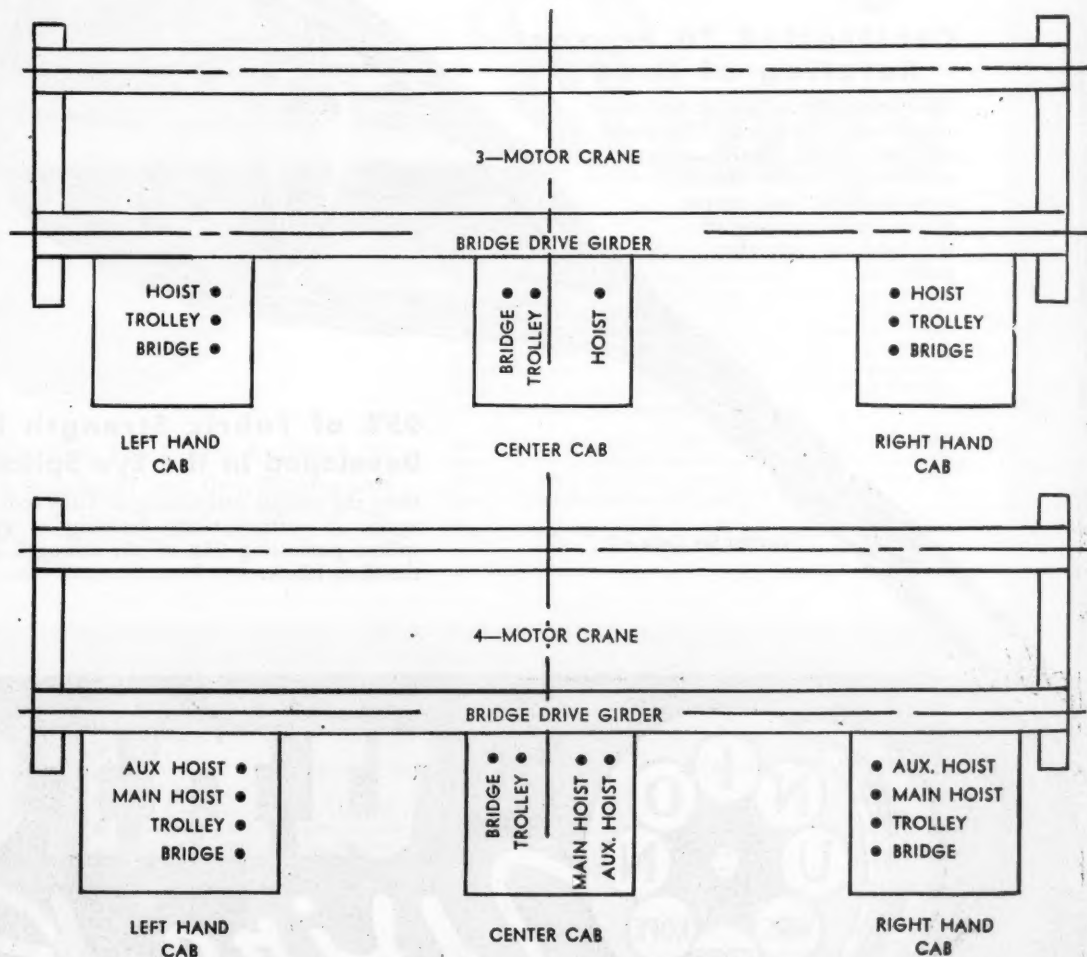
*A range of speeds is given for the hoist and trolley travel. The purchaser's requirements and the individual manufacturer's standards will influence the selection of definite speeds. On large capacity cranes slower hoisting speeds may be desirable when an auxiliary hoist is specified.

Appendix "B"

Average Crane Operating Speeds
For Standard Industrial Service Cranes

The illustration below shows the standard arrangement of controllers in the operator's cab of three and four motor cranes. The controllers will be arranged in these relative positions unless a different arrangement is specified by the purchaser or special conditions require a different arrangement. In cases where more than one crane operates on a runway particular attention should be given to the controller arrangement.

The purpose of the diagram is to show the relative sequence of controllers in relation to the crane hook and is not intended to indicate the exact location of the controllers.



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Interlaced By Machine

On special precision machines, originated by Union Wire Rope engineers, three three-strand parts are so interlaced as to form a sling fabric so much stronger, with so much tougher wearing qualities and with so much more flexibility that you just have to see how much longer service it gives to believe it.

Constructed To Prevent Rotating of Load

The inequalities of hand made slings are eliminated. The parts of Tuffy Sling fabric are so uniquely interlaced that they neutralize the load torque which causes rotating of the load on straight pulls.



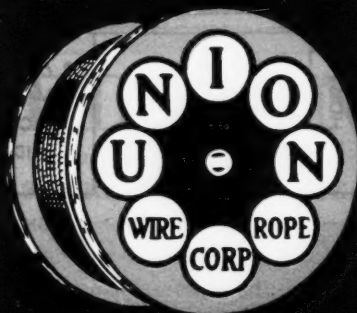
Tested Strength Is Twice Safe Working Load Limits

Metal tags on Tuffy Slings give their safe working load. Each sling or leg of a bridal sling is proof-tested to twice this safe working load.

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95% of Fabric Strength Is Developed In the Eye Splices

Here the unique interlacing of Tuffy scores again. It permits ready forming of eye splices possessing 95% of the strength of the sling fabric.



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Tuffy Slings

Tuffy Sling Fabric also Available for Eye Splicing in Your Own Rigging Loft

If you are rigged for eye splicing your own slings, Tuffy Sling fabric is available on the reel. Your riggers will like the ease and speed of splicing that Tuffy interlaced construction affords.

Working any sling under load with knots or kinks in it is not recommended. But, sometimes it's unavoidable. Then is when the ultra-flexibility of Tuffy Slings stand you in good stead. Tuffy can take more of such punishment longer and you can straighten them out more often without material damage. The same is true of flattened eyes and because of the unique interlaced fabric construction, cutting of any one of the 9 strands will not result in stranding of the sling.

For a long time now, Tuffy Slings have proved they have the extra strength and ultra-flexibility to stand up during longer service on any kind of a load, under any kind of pull and with every type of hitch.

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Low-Cost Shingle

THE most outstanding savings were realized in the storage and handling of composition roofing, made possible by the application of what we believe to be a new

method of storing this space consuming item.

Although our warehouse annex was designed for storage of nails, flat sheets, barbed wire, fence and

similar wire products in addition to composition roofing, this paper covers only the roofing material because it is believed to be of most interest to other readers who may

1. Space savings

A. Old method (assuming storage was on 48" x 48" pallets)

- a. Shingles—150 pallets maximum stock. Each pallet requires a space 4' 6" x 4' (allowing for space between rows), or 18 sq. ft. each. $150 \times 18 = 2700$ sq. ft. required.
- b. Rolled roofing—80 pallets maximum stock. $80 \times 18 = 1440$ sq. ft. required for rolled roofing one layer deep. When stacked on end, the rolled roofing is not restricted as to stacking height as are the shingles. Assuming all rolls double stacked, we cut the above in half, or allow a total of 720 sq. ft. to give the old method the benefit of the doubt.
- c. Aisle space. Under the old method, the aisles may be only wide enough for two loads to pass, or 9 feet. Assuming this was arranged along one side of the warehouse with only one aisle, we would have $9 \times 117 = 1053$ sq. ft. Assuming the aisle will be used for other material on opposite side we cut this in half to give us 526 sq. ft.

d. Totals.

Shingles 2700 sq. ft.
Rolls 720 sq. ft. (handstacked 2 high)
Aisle 526 sq. ft. (only half of actual)

3946 sq. ft. Total space required

d. Totals.

B. New Method (using fork lift truck)

- a. Shingles—150 pallets maximum stock. Stacked in tiers 3 high, floor space occupied by only 50 pallets. $50 \times 18 = 900$ sq. ft. required.



- b. Rolled roofing—80 pallets maximum stock. Evenly placed on pallets, rolls are stacked 4 tiers high—80 pallets stacked in floor space occupied by only 20. $20 \times 18 = 360$ sq. ft. required.
- c. Aisle space. Arranged between two aisles, the above uses half of each, the other half serving other materials. Aisles must be 11 feet wide for lift truck. $11 \times 63 = 693$. Half of this for two aisles makes net of 693 sq. ft. required.

Shingles 900 sq. ft. (stacked 3 high)

Rolls 360 sq. ft. (stacked 4 high)

Aisles 693 sq. ft. (half of two aisles)

1953 sq. ft. Total space required

Storage

By **BAXTER R. GRIER**

Assistant Superintendent
Alamo Iron Works
San Antonio, Texas

Fork Lift Trucks, Pallets,
Special Storage Racks.

have similar problems.

Because their own weight will cause the shingles on the bottom of the pile to stick together if stacked too high, the manufacturers recom-

mend that composition shingles be piled no higher than approximately 3' 6". This makes it quite a storage problem when attempting to make maximum use of cubic space

in a warehouse.

Under our old method, this material was stored on 30" x 42" platforms (then our warehouse standard) and moved by hand lift

C. Total space saving

Old Method 3946

New Method 1953

Net Saving 1993 sq. ft. building space
x 6.5 cost per ft. of new whs.

\$12,954.50 Amount saved in cost
of new warehouse

2. Equipments savings

If we had used the 30" x 42" platforms formerly used, we would have required 112 more platforms than pallets, to hold the above stock of roofing.

Platforms required 342 @ \$4.40 ea. = \$1516.80

Pallets required 230 @ \$3.30 ea. = 759.00

Saving by using pallets \$ 757.80

3. Savings in Handling Costs—using lift truck

Old Method .73 hours per ton

New Method .30 hours per ton

Saving .4 hours per ton

Annual tonnage handled (est.) 1000 x .4 = 400 hrs.
saved. 400 hours @ \$1 = \$400 saved in handling.

4. Cost VS Savings

A. Savings

Space 12,954.50

Equipment 757.80

Handling labor 400.00

Total Savings \$14,112.30

C. Total Savings

Gross Saving \$14,112.30

Cost 2,620.00

Net Saving
(first year) \$11,492.30



"DRIVE THROUGH" racks (this page and opposite page). Two views show five-high tiering arrangement and ability of fork truck to drive through rack for second and center pallet.

B. Costs

Rack	\$1000.00	Actual cost
Lift truck	1500.00	\$3000—used
Annual cost of operation of 1/2 lift truck	120.00	approx. 1/2
		time for other work.

Total Costs \$2620.00

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Careful planning of anticipated handling and storage problems in this warehouse addition resulted in considerable economies in building costs, equipment requirements and in handling time, with a net total saving in excess of \$11,000. This prize-winning paper was awarded \$100 in the 1948 FLOW Cost Analysis Contest.

trucks. Even this was a great improvement over the "ancient" way of stacking the roofing on the floor, but it poorly utilized the "air rights."

In the advanced stages of our planning, we decided to use pallets and fork lift trucks, and that the 48"x48" pallet was the size best suited for the majority of the material handled in our organization.

The stock of roofing we planned to have, when broken down into 48" x 48" pallet loads, was as follows: 150 pallet loads of shingles (approximately 2100 squares) in two different types, the square and hex, with nine different colors in each, or a total of 18 different types of shingles; 80 pallet loads of rolled roofing (approximately 2000 squares) in eight different kinds.

With these very basic decisions made, we had two standard alternate methods to choose from which would permit us to stack the pallet loads of shingles without superimposing them.

"Drive Through" Racks

One method was to use special pallets with legs or frames, made so that when stacked the weight would not rest on the material that was stored on the pallet. After long consideration this was decided against because the special pallets required would cost approximately \$4000 more than the same number of standard pallets. We also wanted to have all our pallets the same, so that when empty they could be used for other purposes and not become a storage problem in themselves.

The other standard method would have been to use the conventional pallet storage racks. This would have permitted us to use standard pallets but would require for the above stock, in racks 3 deep, a total of 3078 sq. ft. to be assigned to roofing storage. Of this figure, 1782 sq. ft., considerably more than half the total area, would be used as aisle space. This seemed out of reason and led to the development of what we have called a "drive through" rack which permits this entire stock to go into only 1953 sq. ft., including aisle space.

This so-called "drive through" rack is of simple construction, consisting primarily of 20 ft. long horizontal 6" x 4" x 1/4" angles welded to 1 1/4" square steel vertical posts, the angles turned with 6" leg horizontally and spaced in such a manner that they support a 48" x 48" pallet with sufficient clearance between vertical legs to allow movement of the pallet but not enough space to allow the pallet loads to fall between the angle supports.

The 20 ft. long angles permit five of our 48" x 48" pallets to be placed in each "row," the loads being in three tiers, making a total of 15 pallet loads placed in the same floor space otherwise occupied by only five loads.

Since there is no cross bracing except under the center pallet, a lift truck may "drive through" the rack to handle the second and the center pallets. This feature is what eliminates the aisle space normally needed to get around to the other side of the rack.

As may be seen in the photographs, there is sufficient clearance to allow the lift truck to remove the loads from the floor and second tier without moving the top tier of pallets.

This feature is an advantage not found in using the frame type pallets, which require the top load to be moved first.

The figures and explanations given compare the previous method of storage with the new method used, and show the resulting savings.

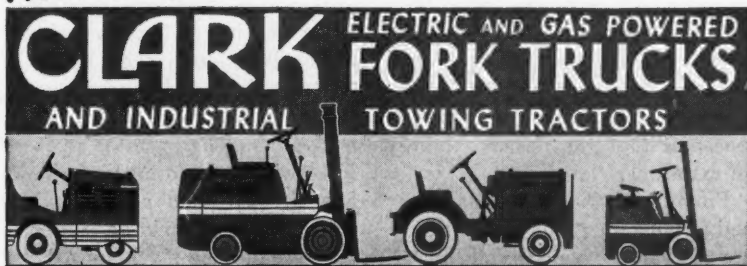
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Gravity Conveyors

IN A MULTI-PRESS LAYOUT

A simple conveyor flow designed for a high-volume multi-press layout in compact space. Several kinks merit your attention.

By **WALTER EWEND**

Material Handling Engineer
The Budd Co., Detroit

Gravity wheel and roller conveyors, some with interesting modifications.

THE flow described through this layout involves seven presses and two resistance welding machines, which are arranged in a rectangular area 30' x 60'. The flow between machines is primarily over a series of gravity wheel and roller conveyors plus a minimum of powered sections. Slight modifications made on gravity wheel and roller lines proved important aids to production as well as the material flow. These modifications, simple in themselves, may be of help to other material handling engineers in solving problems similar to those we encountered.

Dual Gravity Wheel Line Solves Flow Problems

The products are rear and front brake housing plates for passenger automobiles. Approximately 12" in diameter, they are stamped from 10 and 11 gauge steel. Rear brake housing plates start on Press No. 1, the front plates on Press No. 2. The reason is that the former require an extra operation.

From Press No. 1 (a blanking and forming operation), the blanks are discharged from the die by a pantograph, or articulated unloader arm, which delivers to a gravity roller line set up at right angles to

the machine. (All moves can be followed conveniently on the accompanying flow sheet.) At this point the first of the modifications mentioned was made.

The head end of this gravity roller conveyor has been converted to a speeder section with the addition of a 3" x 48" canvas belt powered by a 1/2 HP motor. The reason we powered this 48"-long section is that the pitch of the line is slight, and the powered rollers at the head end give the relatively light blanks the necessary momentum to travel the 16' distance to Press No. 2. The speeder section also assures that the blanks will be taken away as fast as they are discharged from the machine.

After the forming operation on Press No. 2 the flow is split on a dual gravity wheel line for the rear brake housing plates, whereas the front plates are picked up by a pantograph and delivered over a straight gravity wheel line to the next press. The operator at Press No. 2 places the formed rear brake housing plates on a skate wheel conveyor which makes a 90-degree turn around the machine to Press No. 3. Unlike the front plate, the contour of the rear plate is such that it cannot be picked up by the

die on its upward stroke, and hence the manual removal. The two plates are not run at the same time. The front plates, which require one less operation than the rear plates, start on Press No. 2 in this layout. The rest of the distance both units move over the same lines.

Scrap Removal For Flexibility

From Press No. 1 the outside scrap is discharged via a chute to a portable belt conveyor which delivers to a skid bin. The center part of the scrap drops through the die into a box spotted in a pit. The continuous removal of the outside scrap to a container at floor level avoids tying up the traveling

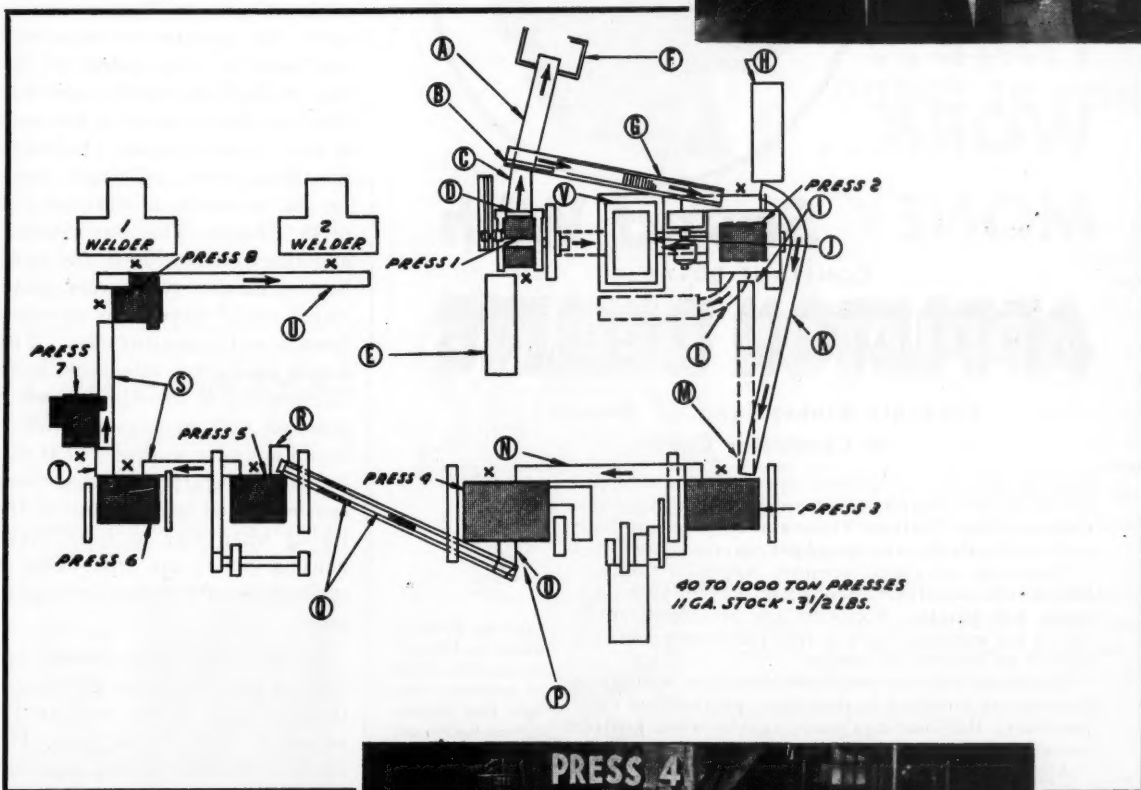
LEGEND FOR LAYOUT, RIGHT

"A"—16" wide inclined flight conveyor for scrap; "B"—3" wide take-away belt; "C"—scrap chute; "D"—pantograph; "E"—rack 30" wide; "F"—scrap box; "G"—roller conveyor for rear hsg. plates; "H"—rack fts.; "I"—unloader; "J"—round centers scrap box; "K"—2" spaced wheel conveyor for front hsg. plates; "L"—scrap chute. (Portable scrap conveyor is moved here when rear hsg. plates are made.) "M"—wheel conveyor added here for rear hsg. plates; "N"—wheel conveyor; "O"—and "P"—pantograph and chute; "Q"—roller conveyor with 5" wide powered belt; "R"—stand; "S"—wheel conveyors; "T"—table; "U"—spaced wheel conveyor.

PRESS 1

"A"—4" take-away belt. "B" is scrap conveyor. Note plates traveling down gravity conveyor rollers.

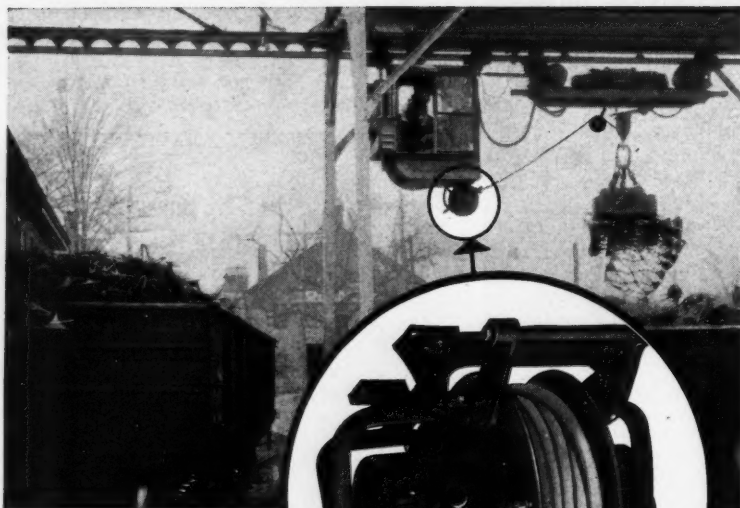
LAYOUT AT No. 2 press. Rear plates flow over line at right. Wheels are spaced, far right.



NARROW BELT POWERS roller conveyor, which elevates plates about 24" between presses.



PRESS 5



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bridge crane for extra scrap handling; the full skid bins are moved out by platform truck. Moreover, the short portable powered scrap conveyor gives us a certain amount of flexibility which is desirable. The compact unit is shifted to Press No. 2 when the front plates are made.

Carrying Surface Adapted to Contour of Plates

Another modification is introduced beyond Press No. 2 by spacing the wheels of certain gravity wheel conveyors. The rear brake housing plates come out of Press No. 2 with two 1" bulges in a "down" position. Rather than require the operator to turn each unit over for easy rolling on the line, we had the wheels spaced to form two lanes leaving a free area of 3½" between them. The bulges are thus prevented from being caught by wheels, as shown in one of the photos. This was a simple and effective solution to the problem of turning over every plate, which would have been an interference with production. The hourly production rate is 600 units. The spacing of the wheels made a powered belt unnecessary, which would not have worked well at this point. The gravity wheel sections can be shifted into and out of the layout when rear or front brake housing plates are run. This is easily done with the present equipment.

At Press No. 3 (a restrike and forming operation), the plates continue at right angles over an 18' section to No. 4, a trim press. The operator at this station does not have time enough to remove the trimmed units and place them on a conveyor line. For that reason they are unloaded from the opposite side of the machine by a pantograph to a roller conveyor which is powered with a 5" belt running down its center. This line, 20' long, is powered since the pieces must be elevated approximately 24" in traveling from the discharge side of No. 4 to the feed side of No. 5, where flanging is performed. The

powered conveyor is slow-paced with a fractional HP motor to the desired speed.

The flow sheet shows how two additional gravity wheel sections connect from No. 5 to No. 6, No. 7 and No. 8. Press No. 7 pierces a cable hole in the rear housing brake plates and is therefore bypassed by the front plates.

Extending at right angles from Press No. 8 (which punches the cylinder hole) is the final conveyor section in the layout. This is made up of two 10' gravity wheel sections, whose wheels are also spaced in order to accommodate the 1" bulge. The flow sheet shows the two welding machines located across a narrow aisle from this conveyor.

The operator at Press No. 8 makes up stacks of 10 plates each, and places these on the line feeding to the welders (where small reinforcing plates are welded to the units). The first welder lets each alternate stack pass to the second operator, and thus both receive an adequate supply in a form that is



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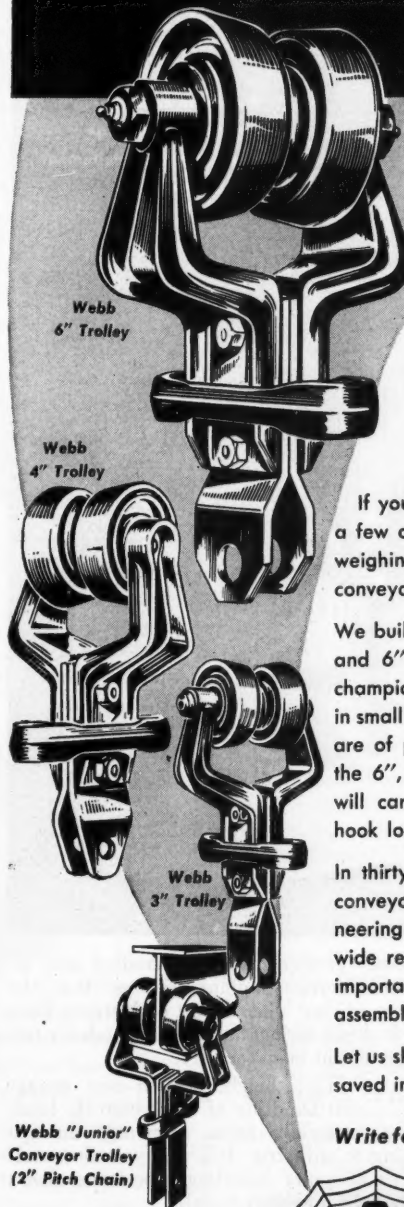


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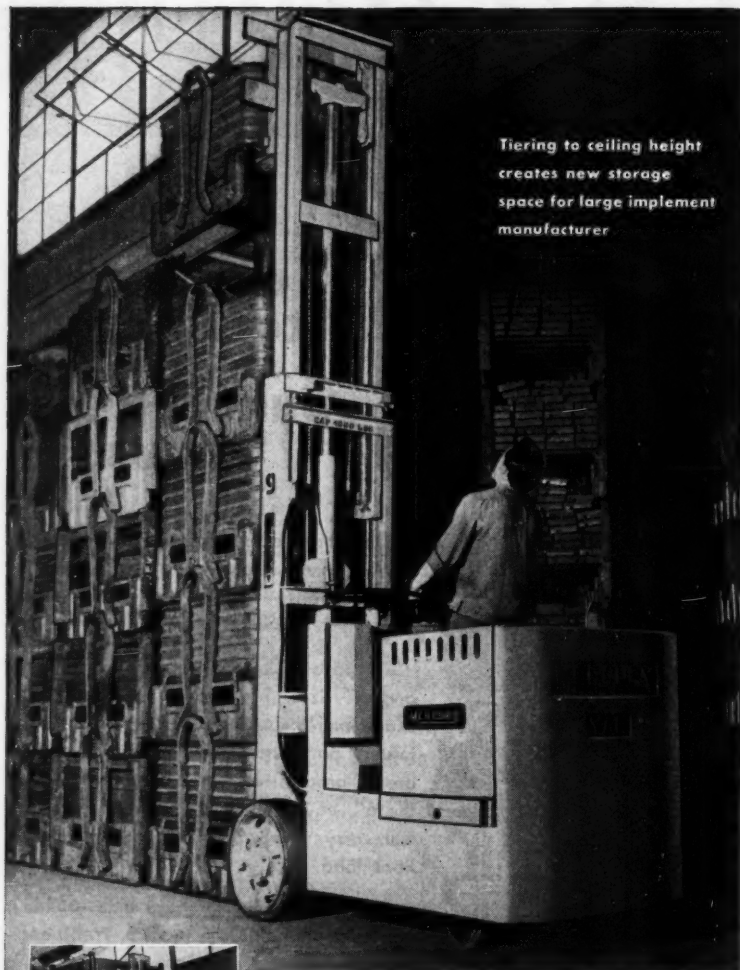
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The stacks of welded plates are deposited by the operators in skid bins, and are then transported by platform trucks to the assembly department in another part of the building.

Reviews Operating Features

This completes the flow through this multi-press layout, which stops across an aisle from Press No. 1. With the present arrangement it was possible for us to solve the problems of the bulges and squeeze the layout into a relatively small space. The speeder belt (on the head end of the gravity roller conveyor at No. 1 Press overcame the problem of the slight slope in this line and also provided a positive take-away for parts. The use of gravity lines not only provide a uniform flow between presses, but the various sections also serve for intermediate storage. (This is vital, for example, in supplying the welders.) The addition of the pantographs enabled us to make maximum use of operator-hour production. The setting up of dual lines (as between Presses No. 2 and No. 3) permitted the running of two different parts in the same layout with a minimum of time required for making the adjustment. Finally, integration of a portable scrap conveyor contributed importantly to the flexibility we needed in this compact, high-volume operation.

JOHAN W. BELANGER, assistant general manager of the Apparatus Department of the General Electric Co., was elected to the board of directors of Allegheny Ludlum Steel Corp. Belanger succeeds Henry V. Erben, General Electric vice president, who resigned his directorship in the steel company.

JOHAN C. RICHARDSON is the new manager of industrial tire sales for U. S. Tires division of United States Rubber Co., according to J. C. Ray, sales manager. Richardson joined the company in 1940 as a field service representative in Detroit. In 1945, he was transferred to Chicago, where he specialized in service merchandising work.

Conveyors

AND MATERIALS HANDLING SPECIALTIES

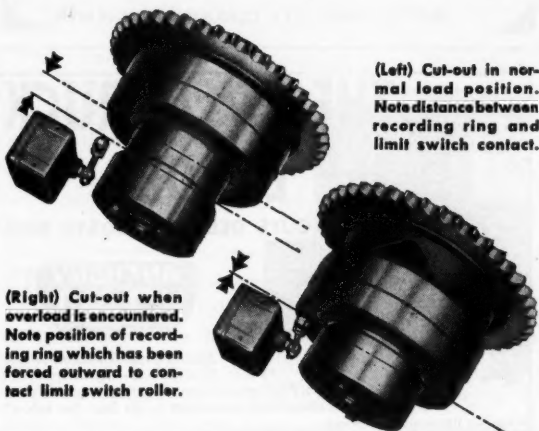
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Write for Bulletin
36-1



(Left) Cut-out in normal load position. Note distance between recording ring and limit switch contact.

(Right) Cut-out when overload is encountered. Note position of recording ring which has been forced outward to contact limit switch roller.

Another is the Overload Safety Cut-out which eliminates down time when a conveyor suddenly encounters an overload. Without this device a drive pin would be sheared off and would have to be replaced while everyone on the assembly line waited.

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2414

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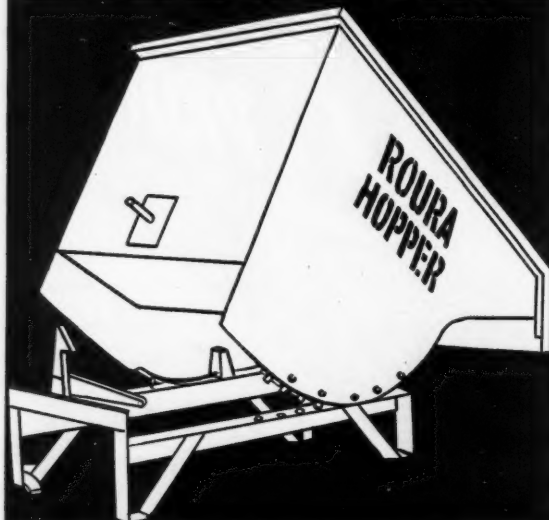
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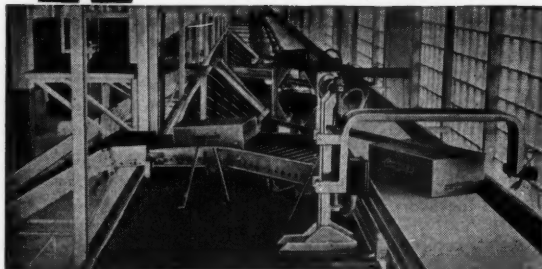
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Institute, Society and Association Chapter Activities

THE Chisholm-Moore Hoist Corp. is the latest member of the Material Handling Institute, Inc. The company manufactures hand and electric hoists, hand power cranes, hand and motor driven trolleys, etc. Don S. Brisbin, vice president, is the company's official representative in the Institute.

CLIFFORD F. JESSE, general manager of the Ford Motor Co., Dallas, was elected temporary chairman of the newly formed North Texas Material Handling Society. E. F. Phelps, Jr., vice president of the Waples-Platter Co., Fort Worth, and Fred T. Towne, president of Gallrein & Towne, Inc., Dallas, were elected committeemen for the organization. The officers were named at the group's first meeting, which was held July 8. The formal organizational meeting was scheduled for the latter part of July, at which

time the group was to request official recognition by the American Material Handling Society. Travis Parish and W. Blackman Davis, president and vice president, respectively, of the Houston chapter of the society, were guest speakers at the July 8 meeting.

THE first annual meeting of the American Material Handling Society, Inc., was held on June 25, 1949, in Cleveland. The following officers were elected for the coming year:

President A. K. Strong, Columbian Rope Co., Auburn, N. Y.; Vice President H. H. Hall, Aluminum Co. of America, Pittsburgh; Treasurer, W. Van Alan Clark, professor at M. I. T., Cambridge, and Secretary Irving Footlik, 8338 So. Dante Ave., Chicago 19, Illinois.

The society was formed from a nucleus of chapters organized originally by the Material Handling Institute, Inc. The desire of the

"TOP BRASS" at a recent meeting in Detroit of the Advisory Council for the Second Wayne University Packaging & Material Handling Institute, which is being

G. Diefendorf, director of the Institute; C. J. Carney, Jr., managing director of the society; and Dean C. B. Hilberry and Dean W. C. Foley, Wayne University. The Insti-



developed by the Society of Industrial Packaging & Material Handling Engineers. From left, Dr. Spencer A. Larsen, council chairman; Dr. David B. Henry, president of Wayne University; J. P. Kinney, of Gordon, Kinney & Staninger, general chairman, Fourth Annual Industrial Packaging & Material Handling Exposition; H.

tute will be the educational feature of the Society's Annual Exposition which is being held this year in Detroit's Convention Hall. Dates of the Institute are Oct. 3 to 7. The Exposition runs Oct. 4 to 6.

A complete listing of exhibitors and other details can be found on page 72 of this issue.

members to become an independent professional or occupational organization led to the formation of the American Material Handling Society. An intermediate step was the formation, in January of 1949, of a group of temporary officers headed by Walter A. Metcalf, of Stop and Shop, Inc., Boston.

The objective of the Society is "to advance the theory and practice of Material Handling and allied arts and sciences by various means, such as:

Developing educational programs in formal meetings of Chapters of the American Material Handling Society, Inc.

Working with recognized educational institutions for the advancement of the industry.

Establishing a clearinghouse for the exchange of technical and engineering data covering all phases of the material handling industry.

Helping to organize additional Chapters and assisting them in setting up their programs.

Improving the relationship with established allied engineering and technical organization.

Seeking to have properly recognized by Industry, Colleges, State and National Bureaus the proper status of the Material Handling Engineer.

Assisting in the development of material handling personnel."

The Society at this time consists of eight chapters: New England, Syracuse, Indianapolis, Chicago, Detroit, Houston, Pittsburgh, and Louisville.

THE realistic side of package cushioning design and application was presented by S. L. Swenson, product engineer, Kimberly-Clark Corporation, Neenah, Wisconsin, in a talk on June 8 to the Detroit Chapter of the Society of Industrial Packaging and Material Handling Engineers. An understanding of the basic cushioning principles of bracing, blocking, flotation and finish protection was emphasized by Swenson as being important in fostering better cushioning techniques.

REFRIGERATED WAREHOUSE...

(Continued from page 24)

erated warehouse connect with the storage rooms by electrically operated air-lock doors. These consist of two sets of flap doors enclosing an air lock. Electric eyes cause the doors to open when a truck breaks the beam. The first set of doors closes before the second set opens, to reduce as much as possible the loss of refrigeration. There are two

air locks for each room—one for in traffic and one for out.

The factor of accessibility to railroad and highways needs no detailed explanation. The better the transportation, the better the service any business of this kind can give. The Alford project fronts on a wide public trafficway that has easy, quick connection with all parts of the city. It is less than a mile from the main and alternate routes of U. S. Highway 80, the

southern transcontinental route. As to railroads, the warehouses are adjacent to the exchange yards of the 10 railroads serving Dallas.

Fork-Truck-Pallet Method

Mr. Alford pioneered fully-mechanized operation in the refrigerated warehouse industry. The



SHORT HAUL from car to storage. Power doors controlled by photo-electric cell speed flow.

fork-truck-pallet method was found most desirable from an efficiency and economy standpoint.

Because of the variety of products handled, two pallet sizes were adopted: 40" x 48" and 48" x 48". Fork trucks are of 4000 lb. capacity on a 48" load center and have a 144" lift.

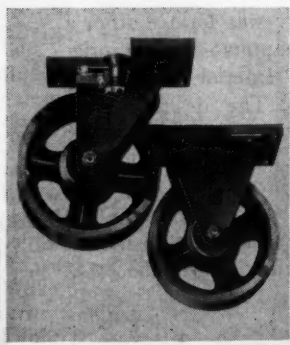
There is a wide spread in the average tonnage handled per man-hour owing to the size, type and shape of the goods. At present the spread is from 3500 to 5000 lb. per manhour. It is too early to give a definite figure.

Goods from incoming carriers are unloaded to wooden pallets. Fork lift trucks move the loads to the assigned space in storage. The floors of the storage rooms are permanently marked with aisles to insure fullest use of space consistent with efficient operation.

At that time the delivery carrier is spotted near to the particular room. If the shipment is to leave the city, it is taken from the pallets. In many cases of local consignments, the loaded pallets are placed in the customer's truck. This saves time, and the customer can return the pallets later—empty or with a new lot for storage.

DARNELL CASTERS & WHEELS

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FREE Manual

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This mechanized operation requires careful planning and execution of the plans. Thorough training of workmen, it was found, was a basic factor in realizing the plans that were made. Fork truck operators are trained to pick up loads, transport them, and stack them accurately. The need for safety and full use of space is stressed.

The planning itself involves the

NEWS FROM THE SALES FIELD

LARKIN EQUIPMENT CO., 1110 Broadway, Albany: This company has been appointed sales representative in the Albany, N.Y., area by the Automatic Transportation Co. The announcement was made by Philip E. Whiting, eastern district sales manager of Automatic. The appointment was the first of its kind since the manufacturing concern recently opened its sales branch in New York City.

MATERIAL HANDLING EQUIPMENT CORPORATION, Cleveland: Effective July 1, 1949, this company became exclusive local dealer for the Industrial Truck Division, Clark Equipment Co. In line with a recently announced change in policy of the Clark Industrial Truck Division, the Cleveland concern, formerly a factory sales representative, now handles the Clark account on an independent, self-owned basis.

The Material Handling Equipment Corp. announces that the change will mean enlarged facilities, the carrying of a stock of authorized Clark parts, as well as complete repair service by factory-trained personnel.

Officers of the Cleveland dealer are: President Glenn R. Case, and Vice President James H. Lopeman. The recently changed address is 2425 St. Clair Ave., Cleveland 14, Ohio.

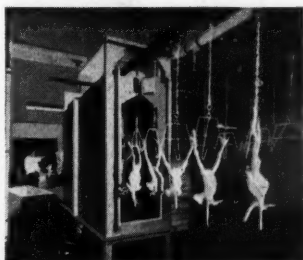
EXPANSION of eastern facilities has been announced by The Union Metal Mfg. Co. A. D. Bowman, of A. D. Bowman, Inc., who has represented the company in Connecticut since 1939, has established a second office at 60 E. 42nd St., New York. Henry G. Thole will be in charge. Bowman will continue his headquarters at 48 Leavenworth St., Waterbury, Conn., and will represent Union Metal in western Massachusetts, eastern New York state and northern New Jersey, in addition to the Connecticut area.

spotting of public or private carriers where time in movement to storage will be reduced to the minimum. This protects the merchandise from thawing. It involves full knowledge on the part of supervisors of the amount and location of available storage space at all times. With this knowledge, space is used to the fullest extent possible.

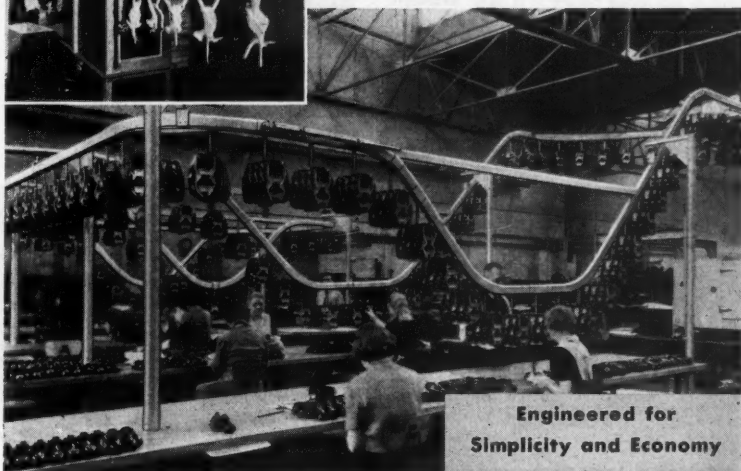
As part of the constant inventory of space, and for the benefit of customers and efficiency of operations,

an electrical punch card system is used. In a few minutes the machines show how much merchandise is stored, where it is, how long it has been there. This system is maintained in such detail that it reports on single cases or packages.

An air-conditioned four-story office building is now in the process of construction. It, together with the two storage structures, is expected to become the food industry center of the Southwestern States.



Turkeys or Telephones...



**Engineered for
Simplicity and Economy**

**For handling efficiency and economy
recommend R-W Power Conveyors**

Efficient, economical handling and movement of materials means lower production costs. Today, in all kinds of plants, Richards-Wilcox Conveying Equipment is solving this handling problem to perfection. The extreme flexibility of R-W ZIG-ZAG Conveyors makes them readily adaptable to the most complex plant layout.

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AURORA, ILLINOIS, U.S.A.
Branches: New York, Chicago, Boston, Philadelphia, Cleveland, Cincinnati, Washington, D. C.,
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St. Paul, Denver, Salt Lake City, Seattle, Portland, Tacoma, San Francisco, Pittsburgh

- Horizontal and vertical wheel units alternate in a continuous chain traveling through special steel tubing.
- Complete flexibility for installation in any plant. Easily installed, easily changed to conform to plant alterations.
- SAFE—all moving parts fully enclosed.
- Low first costs. Low power factor.
- Load capacity: Single suspension 65 lbs. per foot—double suspension 125 lbs. per foot.
- Standard horizontal or vertical curves—two-foot radius. (Stock load pendants including automatic turning units available.)

PHILA. AREA RENTAL



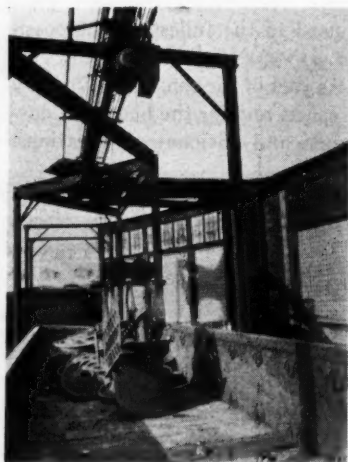
PORTABLE has the right material handling equipment for the right job! Leaders in equipment rentals, your requirements are sure to be found in our immense stock. Rentals can be made daily, weekly and yearly.

If you're in the market for re-built equipment, a card will bring our latest illustrated catalog. We handle the best machines available, and each is job-tested before it is sold, available for immediate delivery. See Portable for a lift!

Sales • Rentals • Service
PORTABLE SERVICE
EQUIPMENT CO., Inc.
3519-31 N. FRONT ST., PHILA. 40, PA.

ERIE WHEEL SHOP . . . (Continued from page 36)

trolley wheel No. 8 strikes the live trolley section (made live by the selector switch), another series of



TRIANGULAR attachment overbalances carrier, causing wheels to be discharged from ends. Carrier then returns to start of cycle.



The REASON FOR

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DESIGN**

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. is the increased efficiency of your materials handling operation. To do your job, a pallet must be designed for your particular needs. **ENGINEERED DESIGN** pallets are manufactured exactly to your specifications—your assurance of increased efficiencies and resulting economies. Write, wire or phone today for a free estimate.

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If lightweight magnesium is applicable to any of your products, our facilities warrant your serious consideration.



Our Materials Handling Line
Includes MAGCOA Hand Trucks,
Barrel Skids and Grain Shovels

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relays and contactors takes over, stopping the forward motion of the traveling hoist and lowering the load. When the load is rested in the car, a slack cable switch stops the hoist from lowering further.

The carrier is a rectangular two-section structure, welded of $\frac{3}{8}$ " steel plate, which swings from an overhead axis. One wheel rides in each section, resting in a depression to keep it from rolling out during travel. A triangular structure is welded to the bottom of the box. As the box is lowered to the car floor or pile, the attachment causes the container to tilt, discharging the wheels from either end.

The slack cable switch makes a contact which actuates the up relay. Following a time delay of five seconds, the self-emptying bucket is raised. The monorail carrier returns automatically to its point of origin, where it is lowered to the loading position (outside the building) in front of the wheel chute. The bucket remains in the loading position until the start button is pressed, when the cycle is repeated.

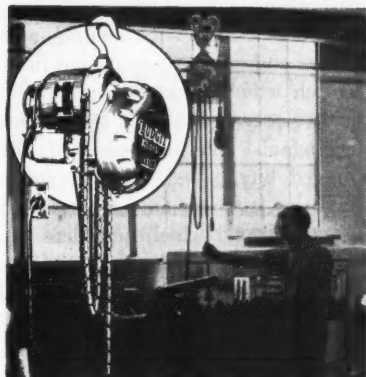
Safety features are incorporated to forestall accidents. If electric power should go off after the hoist has left the loading point, it will remain where it was stopped until a re-set button is pressed.

The loading station is a recessed area (a three-sided shaft which is lined with $\frac{3}{8}$ " steel plate). As the carrier descends, two rollers at the ends of its axis are caught by flared guides leading to a channel track, which in turn positions the carrier. A pit in the ground accommodates the triangular structure below the carrier bed, which is thus lined up with the wheel chutes leading to it from the building.

Axle Disposal Is Also Automatic

After the wheels have been deposited by the hoist in the chute, the scrap axle is placed on the bed of an axle buggy. Following are the steps of this procedure. The flanged-wheel buggy is positioned in the work aisle on a gravity track, and held in place by a counterweight against a stop. As the axle is placed on the buggy, the weight of the load overcomes the resistance of the counterweight (the latter being connected by means of a thin wire rope to the rear axle of the buggy). The bed of the buggy is leather-covered, providing a slip-proof surface.

As the loaded buggy starts down the inclined track, it hits a limit switch, which actuates the opening mechanism of the elevating door



Check yours!

You'll be delightfully amazed at how 'Budgit' Electric Hoists enable workers to produce much more, at greatly reduced costs, on your production, assembly and inspection lines—wherever it is necessary to lift loads. When business is harder to get and costs are high, these added savings are vitally important.

'Budgits' have proved their worth on-the-job in hundreds of industries—in many thousands of installations. They save valuable time—precious minutes in every working hour. In addition, workers like 'Budgits.' Their jobs are made easier and they are freed from the fear of sprains, rupture and over-tiredness to devote all their energies to more production.

Wherever lifting is an important part of the day's work, 'Budgits' pile up these double savings for you. No installation cost! Simply hang up, plug in, and use. Current consumption is trifling.

Have your entire plant, warehouses, and loading platforms checked now. See how many spots there are where 'Budgit' Electric Hoists would save you money by getting more done with less effort.

Made in sizes to lift 250, 500, 1000, 2000 and 4000 lbs. Prices start at \$119. Write for Bulletin No. 391

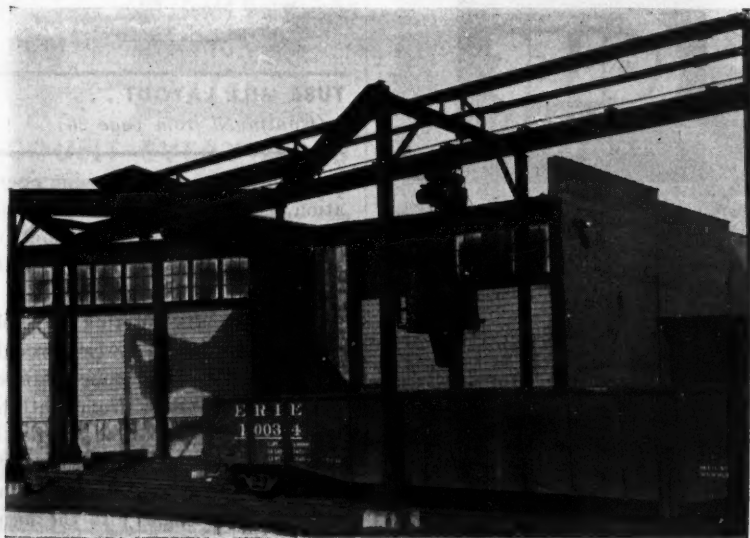


'BUDGIT' Hoists

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Builders of 'Shaw-Box' Cranes, 'Budgit' and 'Load Lifter' Hoists and other lifting specialties. Makers of 'Ashcroft' Gauges, 'Hancock' Valves, 'Consolidated' Safety and Relief Valves, 'American' Industrial and 'Microsen' Electrical Instruments.

CARRIER of automatic dispatch system stops at selected station over car, then lowers.



just ahead. The buggy rolls outside through the wall opening, and at the end point hits a second limit switch which actuates a pneumatically operated arm. It plunges up against the underside of the hinged buggy bed, thus discharging the axle on an accumulation gravity rack which parallels the building for about 50 ft. (From here the scrap axles are loaded by yard crane into cars.)

Meanwhile the pull of the counterweight returns the empty buggy

up the 15-ft. track into the shop. The vehicle hits a second limit switch inside the building, causing the door over the wall opening to close. The buggy comes to rest against the previously mentioned stop, which is approximately 30 ins. from the end point. (This part of the track is in the line of travel of the hoist serving the aisle.) When the buggy is needed, a step on a pedal at floor level releases the stop between the tracks, allowing the counterweighted vehicle to roll

back to the loading position at the end point.

Layout, Production, Handling Aspects

The procedures described are as significant from a production and layout standpoint as from that of material handling. Due to the large percentage of scrap, any accumulation of it within the plant would quickly lead to a problem involving safety, housekeeping, and obstruction of the normal work flow. The present arrangement barely permits such scrap to enter the plant. Five feet beyond the demounting press the axles leave the building, and five ft. east of the axle buggy the wheels are immediately shunted into the monorail carrier. Moreover, the scrap is removed in such a way that practically no physical handling is entailed in its loading. The scrap axles in a horizontal position on the accumulation rack are accessible to the yard crane without requiring manual manipulation. And the wheels, of which there is a greater volume than of axles, are loaded automatically in the outbound gondolas. No operator is exposed to the danger of strain from lifting. The automatic loading of these units by the monorail carrier is important as a safety factor.

(In the concluding part of this article Mr. Kothe will discuss the flow of wheels and axles which have been okayed for reconditioning through the Erie Wheel Shop.—Ed.)

TUBE MILL LAYOUT . . .

(Continued from page 26)

preceding the actual drawing operation, is in the west part of the room, in an optimum location for serving the drawing benches with the shortest moves possible.

Thus the lifts entering the mill on the east side travel west through prefabrication. The four parallel draw benches extend from south to north. After arriving at the north end, the drawn tubing passes through coiling and testing machines. This area is also the loca-

COLES CRANES in *ANY INDUSTRY*

Where loads are to be handled
beyond the power of man . . .

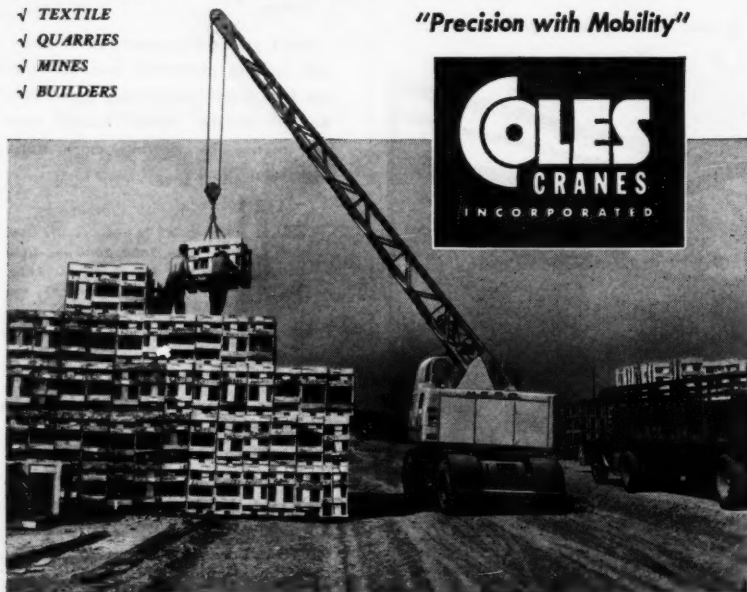
INDUSTRIES USING COLES mobile CRANES!

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• EXCLUSIVE safety features incorporated in all COLES mobile CRANES assure careful material-handling . . . eliminating costly damage. The operator and expensive equipment are protected through Safe-load indicator. The Cantilever type boom provides greater accessibility to work in close quarters.

For name of your nearest dealer, prices or folder write COLES CRANES, Inc., 4307 S. Paulina St., Chicago 9, Ill.

"Precision with Mobility"



tion of the charge end of the long annealing furnace. The annealed units travel back to the south end of the plant through the furnace, and are then discharged near the point of entry of the raw material, which is adjacent to the inspection and shipping department. Over-the-road trucks back into the room through a 10' x 18' powered overhead door. Thus finished goods likewise travel a minimum distance to the outbound delivery vehicles.

The lifts are transported with equal facility either laterally or longitudinally through the tube mill. Unused "dead areas" are entirely absent from this layout.

The parallel draw benches run about two-thirds the length of the mill. These consist of a series of racks and troughs at the head end, a die, and an endless chain conveyor running from the die to the tail end. Because of the crane handling, minimum aisles between the parallel machines can be maintained. At the northeast corner of the room, where more travel area

is available, casters equipment and a fork truck are employed.

Manila and Nylon Slings

Because the copper tubing is easily marred and scratched, special attention has been given to product protection. The crane uses two spreader bars of different lengths (16' and 33') depending on the size of the stock being handled. Spaced at intervals along the top of the bars are U-shaped hooks, to which the spliced ends of manila and nylon slings are attached to form a cradle for the load. This arrangement is shown in one of the photos.

The racks in the mill are constructed of angle iron or sections of steel, and are equipped with wooden fillers which provide a safe contact surface for the tubing.

Design for Smooth Material Flow

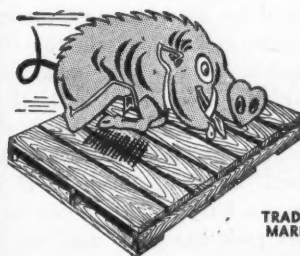
Here is a typical example of the flow through the production cycle. After a three-minute bath in the

Round Corner Pallets PAY OFF!

At small additional cost, your Razorback Pallets can be had with ROUND corners. This feature reduces damage to palletized merchandise as well as lengthening the life of the pallet! Write us for full details!

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Productimeters installed on your conveyors at points of receiving and shipping uncover losses in materials-handling. They register count of pieces... lineal feet... bottles... cases... or revolutionary There's a Productimeter for practically every industrial need—send for bulletin No. 100.

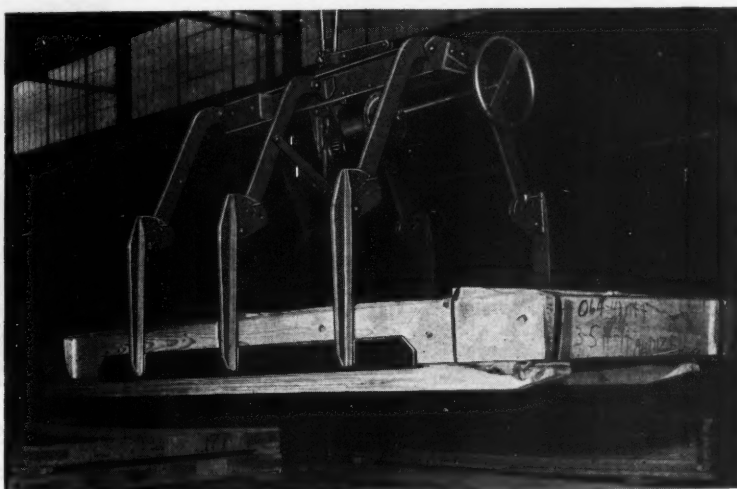
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HERE'S SHEET HANDLING ECONOMY

No better demonstration of the efficiency, flexibility and economy of C-F Lifters can be made than to watch this 5 ton C-F Lifter handle all sheet steel movement in this busy Chicago district warehouse.

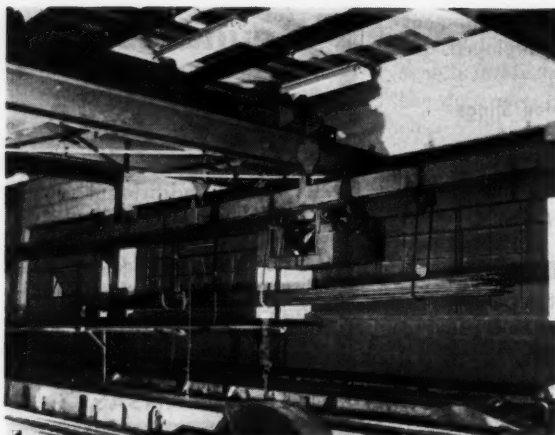
C-F Lifters have quick opening jaws with infinite opening and closing adjustments, permitting them to handle a wide variety of sheet widths—wide bearing angles that safely lift sheets without crimping edges—end control to permit close quarter operation—positive jaw controlling mechanism that holds the jaws open in any position—these and many other exclusive features make C-F Lifters a good investment in materials handling equipment.

C-F Lifters are made in manual and motor operated models in sizes to handle from 2 to 60 tons in standard and semi-special designs.

Write for the Bulletin "C-F Lifters"—it describes the advantages and economies C-F Lifters can bring to your sheet handling jobs.

CULLEN-FRIESTEDT CO.
1320 S. Kilbourn Ave., Chicago 23, Ill.





ELECTRIC CRANE with spreader beam lowers tubing into racks. Manila rope sling support load.



OUTBOUND CARTONS are deposited on vehicle by fork truck. Each carton weighs over 150 lbs.

soap tank, the lubricated tubing is placed by the crane in temporary storage racks alongside the draw benches, or on inlet racks from which the stock is fed to the drawing operation. The temporary storage rack beside each work station serves a useful purpose. If the crane is busy and the stock on an inlet rack has been used up, the operator may draw individual

lengths from the storage rack until the crane is able to deposit the complete lift in working position.

From the inlet rack, two tubes are transferred at a time to a trough which is over the conveyor in front of the die. The tubes are inserted over plug rods and moved backward into a second set of troughs located one foot below the inlet racks. The pointed ends of the

tubes are pushed through the die and hooked in jaws in the tong dolly. This four-wheel dolly has a large hook on the front end which is attached to the endless moving chain for propulsion (its wheels straddle the chain). Each chain is propelled by a 40 H.P. motor.

The tubing is thus drawn through the die, reducing its diameter. Usually the four benches draw

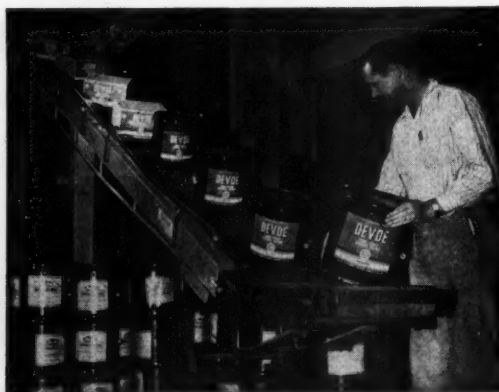
**150% more work
per man hour
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FLOOR-VEYOR

It's true! Your employees do 2 to 3 times the work per man hour with a Rapistan* interfloor power belt conveyor! Here's a typical example: At the DeVoe & Reynolds Co., Inc., Atlanta, Ga., a 5-man crew formerly moved materials into storage at the rate of 900 lbs. per man hour. With Floor-Veyor, the same crew now moves 2,253 lbs. per man hour—a 150% increase in work per man hour!

And Floor-Veyor is just one of the many Rapistan Material Flow gravity and power conveyors designed to cut your handling costs! You choose whatever you need: SINGLE SECTIONS of aluminum or steel gravity conveyor in 5' or 10' lengths, 45° and 90° curves . . . POWER BELTS for horizontal, inclined or between-floors operation . . . a COMPLETE SYSTEM of gravity and power conveyors for cost-cutting material flow!

THE RAPIDS-STANDARD COMPANY, INC., 32 Rapistan Building, Grand Rapids 2, Mich.



**SEND FOR YOUR FREE COPY
of RAPISTAN MATERIAL FLOW AT WORK!**

See how carloading was cut from 80 to 8 man hours . . . how a processor saved \$200 a week . . . how unloading costs were cut from \$17.10 to \$1.90 per car . . . and how Rapistan equipment can work for YOU!

*T.M.

Representatives in all Principal Cities



tubing to different sizes. But since the dies are easily changed, more than one bench can draw to the same size. Frequently stock is drawn on one bench, then passed to another for the final draw. All movement between benches is by crane.

At the north end of plant an operator rolls the finished lengths onto racks which are attached to the side of the bench. The dollies return to the die by a cable and an automatic clutch arrangement.

Final Fabrication—Castered Equipment

The crane transfers the drawn stock to horses which are spotted between two rotary saws. Here the points are cut off, and the tubes trimmed to the desired length, and coiled if so ordered. Coils are placed on six-foot-high verticle posts which are attached to four-castered bases. They are pushed to the annealing furnace, placed on trays (made up of steel grids) and sent through the furnace. Straight length of tubing are transported by the crane from the saws to a feeding table, thence through the furnace. The trays are returned to the charge end of the furnace by a fork truck. It will be remembered that at the discharge end of the furnace the material has arrived at a point close to the shipping area.

The cooled stock is inspected and pushed into the shipping room along a table (a matter of a few feet) to the packing station. The outgoing cartons and boxes are stacked on two-by-fours and placed on the outbound trucks by a fork truck. This method is being studied for a possible change in the future. This area is also used for storage prior to shipment.

It has been shown that physical exertion has no place in the Viking tube mill. The integration of crane handling with the rack system and various types of on-the-floor equipment provide a continuous flow, laterally and longitudinally, with no rehandling or backtracking in this compact space.

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DON'T be misled by extravagant claims of exclusive features made by others. Our new GO-GETTER has all of them that are worth anything.

In this *newest* of Walk-Alongs we have eliminated many weaknesses of competitive trucks. In addition, **ONLY** the GO-GETTER can give you certain recently developed important improvements.

For example, only the GO-GETTER gives you triple reduction gear; maximum 7" traction surface at all times and articulated dual wheel drive. Only the GO-GETTER and one other have positive spring-set deadman electric brake.

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PACKAGING MECHANICS SECTION

A regular monthly section in which are presented solutions to the problems of efficient filling and handling the boxes, cartons, bags, bottles, cases, etc., used in commerce and industry.

C O N T E N T S

FOURTH ANNUAL INDUSTRIAL PACKAGING AND MATERIAL HANDLING EXPOSITION—October 4, 5 and 6 in Detroit. Latest available information at press time is given regarding exhibitors, speakers and special program features..... 72

THE BOX THAT HELPED SOLVE A BREAKAGE PROBLEM. Millions of ceramic insulators for spark plugs are shipped regularly in this operation, and control of the breakage factor was a prime consideration. A simply designed box and pallet handling proved to be the right answer to the problem..... 73

INDUSTRIAL PACKAGING FOR INDUSTRIAL CATERING. Sandwich and pastry packaging is big business in areas where tens of thousands of workers are served daily in hundreds of plants. This report covers the application of packaging machinery in an industrial catering operation..... 77

Fourth Annual Industrial Packaging And Material Handling Exposition

Time and place: October 4, 5 and 6, in Detroit. Convention Hall will be the locale of the exposition, also of the Institute sessions given in conjunction with Wayne University. The sessions are to begin October 3. An export packaging competition will be one of the program features.

EARLY indications are that the Fourth Annual Industrial Packaging and Material Handling Exposition will be a live and well attended event. Sponsor is the Society of Industrial Packaging and Material Handling Engineers. More than 80 leading manufacturers of packaging and material handling equipment, accessories

and supplies have announced that they will exhibit at the show.

Special Exposition Events

Featured on this page are the names of participating companies who were known at press time. Their booth locations are given for your convenience.

At least 7000 conventioners are expected at the exposition and the sessions, according to an estimate by C. J. Carney, managing director of the Society of Industrial Packaging and Material Handling Engineers. The several thousand visitors who attended last year's exposition came from 40 states and
(Turn to page 79)

Exhibitors at 4th Annual SIPMHE Exposition

Exhibitor	Booth No.	Exhibitor	Booth No.	Exhibitor	Booth No.
Acme Steel Co.....	242-243	Gaylor Container Corp...	155-156-157	Nox-Rust Chemical Corp....	203-204
Acorn Wire & Iron Works...	227-228	General Box Co.....	165-166	Official Motors Freight Guide....	111
Addressograph-Multigraph Corp.	265-266-267	General Container Corp.....	248	Geo. H. Pfeil, Inc.....	233-234
American Box Board Co....	187-188	A. J. Gerrard & Co.....		Rathborne, Hair, Ridgway Co.	255-256
American Excelsior Co.....	178-179	Gummed Industries Assn., Inc.	161-162	R.C.S. Tool Co.....	253-254
Angier Corp.....	152-153-154	Hinde & Dauch Paper Co....	211-212	Sefton Fibre Can Co.....	235
Atlas Plywood Corp.....		Inland Container Corp.....	229-230	Shellmar Products Corp.....	167
Automatic Transportation Co.	199-200-201-202	International Paper Co. (Container Div.)	240-241	Sherman Paper Products Co..	163-164
Bartelt Engineering.....		International Staple & Machine Co.....	268-269-270	Shipping Management Magazine	101
Better Packages, Inc.....	210	Jiffy Mfg. Co.....	143-144	Signode Steel Strapping Co..	189-190
Brainard Steel Co.....	213-214	Paul L. Karlstrom Co.		The Stanley Works (Steel Strapping Div.).....	127
Cadillac Products, Inc....	281-282	Niagara Packaging Machinery Corp., Wrap-a-de Machine Co., Clybourn Machine Co....	206-207	Steel Parts Mfg. Co.....	113
Container Co. Div., Continental Can Co.	112	Keene Mfg. Co.....	132	Towmotor Corp.....	191-192-193-194
Container Corp. of America ..	148-149	Kennedy Car Liner Co.....	209	Traffic Service Corp.....	244-245
Glenn P. Crissman Co..	108-109-110	Kimberly-Clark Corp.	159-160	United States Steel Corp. (Gerrard Steel Strapping Div.)	237-238
D. C. Cooper Co.....	271	L & H Wood Mfg. Co.....	146	Volk Stamp & Stencil Co.....	251
Dearborn Chemical Corp.....	158	Markem Machine Co.....	231-232	Vanant Products, Inc.....	131
Derby Sealers, Inc.....	250	Marsh Stencil Machine Co.....	236	Watkins Container Mfrs. Assn....	205
Diagraph Bradley Co.....	252	Melrose Packaging.....	249	Wayne Pump Co.....	239
FLOW Magazine	145	Mid-States Container Corp....	195-196	Wirebound Box Mfrs. Assn....	102-103
Fox Paper Co.....	197-198	National Metal Edge Box Co....	147	Wood Conversion Co.....	128
Freedom Valvoline Oil Co....	125-126	National Wooden Box Assn..	246-247	Yale & Towne Mfg. Co.	104-105-106-107
Fibre Drum Mfrs. Assn.....	283				

The Box That Helped Solve A Breakage Problem

Problem: how to ship millions of ceramic insulators for spark plugs with least breakage? **Solution:** the pallet method and an EASY-TO-HANDLE shipping box cut breakage by 66 per cent.

The data given in this article were released by B. H. SIBLEY, factory manager, in co-operation with J. A. SODEN, assistant factory manager, both of the Toledo plant, and the supervisory management of the Ceramic Division at Detroit.

THE spark plug is the "life" of the internal combustion engine, and the most vital part of the spark plug is the insulator which channels high tension current into the firing chamber of the cylinder. This article describes a handling problem in connection with the shipping of millions of insulators for Champion spark plugs.

Seek Control of Breakage Factor

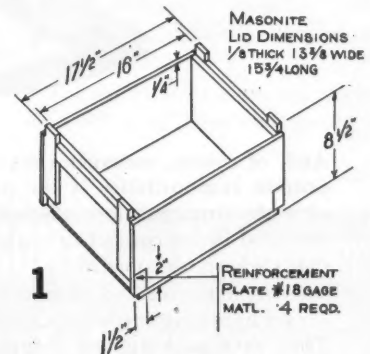
The Champion Spark Plug Company's main plant and home office are located in Toledo, where millions of spark plugs are fabricated and assembled each year. The

Company's Ceramic Division is located in Detroit, a distance of 70 miles over which millions of insulators are shipped regularly, on a daily schedule.

The ceramic insulator must be in perfect condition for assembly; the minutest chip causes it to be rejected from use. While the breakage was originally only a small fraction of one per cent, the large volume of units regularly involved can run this small fraction into a sizable total if the breakage factor were allowed to go uncontrolled.

While the handling practices of former years were gradually super-

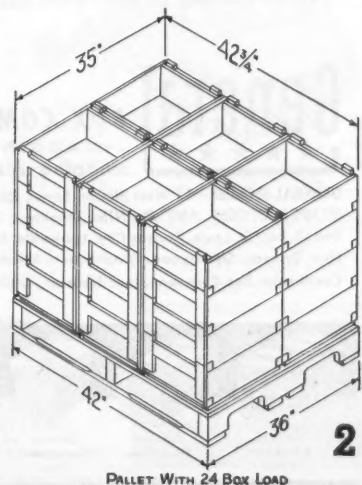
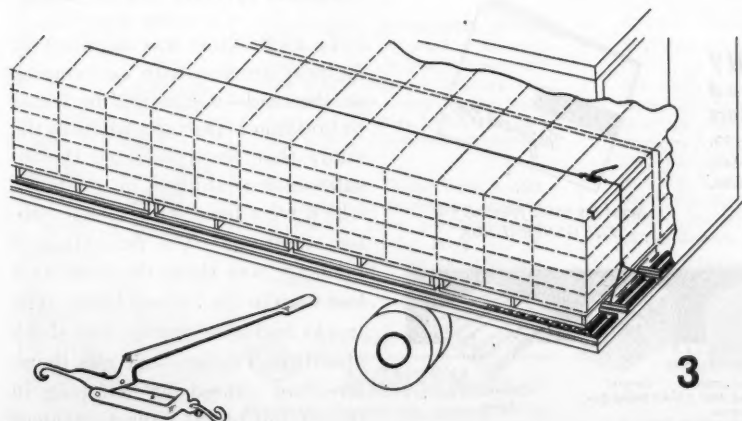
seded by more advanced techniques, it took a thorough study to develop the precise type of container and procedure to meet the prob-



No. 1—THE NEW BOX that helped reduce breakage materially. Cleats at sides serve as handles. No. 2—INTERLOCKING BOXES on 36" x 42" four-way entry pallet make up a firm cube for shipment. No. 3—LOAD BINDER applied to palletized shipment for trip from Detroit Ceramic Division to Toledo.

lem in its several phases. Following are the background data.

Years ago, spark plug insulators were shipped in barrels, packed in sawdust. As a consequence, par-



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Our two Designing and Testing Laboratories are available for the improved packing of your products. They are equipped with the most modern testing apparatus and staffed by experts with many years of experience in designing more efficient shipping containers.

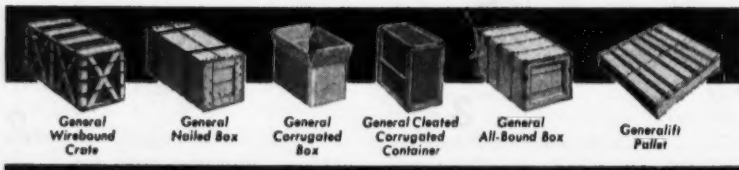
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"THE GENERAL BOX"



PACKAGING MECHANICS SECTION

ticles lodged in the bore (the hollow center through which the electrode is passed), and this entailed a cleaning job. Moreover, the load by the barrel was a cumbersome and heavy unit to handle.

More recently, Champion designed a shipping box (14" wide by 17" long by 7" deep), which had an average capacity for 1500 insulators (shipped loose in the container without packing). By way of explanation, Champion makes approximately 100 varying sizes of spark plugs, including those for jet propulsion and standard aviation engines. The insulator for a typical automotive spark plug is about 2 1/4" long and 11/16" diameter at the shoulder, which tapers to smaller diameters at the ends. "Average capacity" refers to this size unit.

This container was a straight-sided box with a flush-type top that had to be fastened for shipping. Its straight-sided construction made it difficult to handle. It had to be picked up and held by the edges, which tended it to be set down with a jolt. Every additional handling and jarring, of course, contributed to breakage. (While these insulators, made of a refined ceramic by a special process, are extremely hard and can withstand great pressure in certain directions, the repeated impact against the edges produces slight chips.)

Shipment by Truck Not the Cause

To what extent was shipment by highway trucks—with its bumping on the road—a contributing factor to breakage? During a phase of the study that was conducted the insulators were shipped in test boxes which were lined with sponge rubber. Outcome? The percentage of breakage was about the same as it had been in the unlined boxes. The trucks had good springs and shock absorbers. The breakage was, therefore, not caused by bumping in transit, but by the impacts incident

to repeated handlings in which the (straight-sided) boxes were picked up and set down hard.

The findings of the study led to (a) the adoption of the pallet load unit method within recent months and (b) an improved box design. The load unit method would reduce handlings of individual boxes, and the improved box was designed for convenient manipulation (when the containers had to be handled singly). The diagnosis and remedy proved correct. The new method brought a 66 per cent reduction in breakage. (Actually, the pallet-fork-truck method was started slightly earlier in connection with the straight-sided box; but pallet handling and the revised shipping box design are the two phases of the complete project.)

Fewer Handling and New Box

Here is a comparison of the handlings of the individual containers under the old and new methods.

Former handlings (in Detroit): 1. Load on the truck. 2. Stack boxes in the truck. (At receiving point in Toledo.) 3. Off the truck. 4. Into storage. 5. From storage. 6. To production. 7. Spot for assembly.

With the pallet method, however, the individual boxes are handled only twice; once onto the pallet (in Detroit) and then off the pallet in Toledo, when the boxes are spotted in the slots of the assembly tables. Any other move is by the pallet load unit. Thus, repeated handlings of individual boxes—the principal cause of breakage—was reduced from seven to two.

Following are the main features of the new box design, an interlocking type which was developed by the Ceramic Division in cooperation with the Toledo plant. The new box has practically the same dimensions as the old one (see drawings). Two horizontal cleats at the sides serve as handles, which permit the unit to be carried se-

PACKAGING MECHANICS SECTION

curely and set down gently. Four metal plates, one placed at each lower corner as shown in an accompanying drawing, reinforce the corners of the box. They give strength to the assembly and prevent "bumping out of line." These 2" x 1½".

The interlocking posts at the four corners (of 1⅞" x ¾" lumber) extend 1¼" above the box top, with a corresponding recess at the bottom. The lid, of 1⅞" pressed wood, fits snugly into a recess, which eliminates the former need of fastening the covers for shipment. The sides and bottoms are made of ¾" lumber, the ends of 7/8" lumber. The container has a coating of fireproof material (clear phenoplast). This was done as an added precaution.

For shipping, 24 boxes are placed on a 36" x 42" hardwood pallet, a

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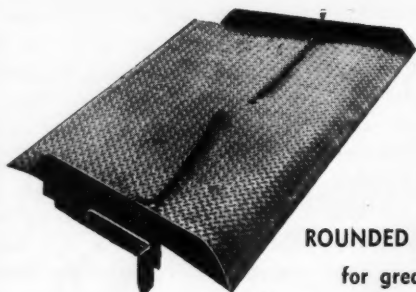
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four-way entry type. The beds of the highway trucks are equipped with five lanes of 12" roller conveyor—one at each side and the others spaced six inches apart. The pallet loads average about 2000 lb. each, and five pallets are spotted on each side in the vehicle. As each pallet load is pushed into place, it is secured by dropping three pins through holes behind it. The pins are a 1/2" diameter rod with a 1" shoulder, having a 10" length overall. The holes in the truck bed are drilled through the angle iron of the conveyor rail and extend through the wood. The interlocking construction builds the containers into a solid cube, which resists the tendency to fall off during transit.

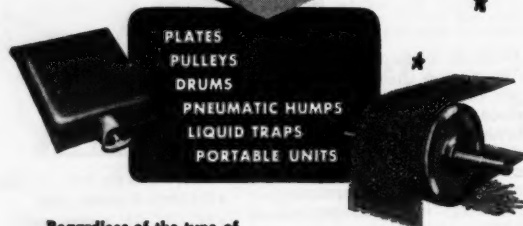
When all 10 pallets have been loaded, a chain locking device (shown) is fastened over the length of the load to counteract side sway.

Thus the remedy was found in two simple, commonsense solutions—fewest possible handlings plus an easy-to-manage shipping box. Perhaps you can use the idea.

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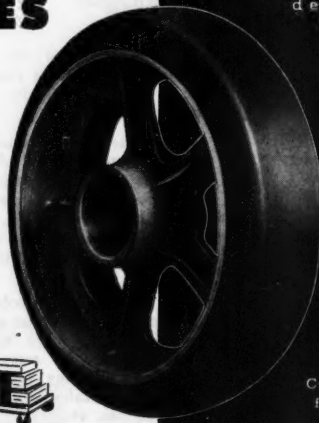


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This automatic wrapping machine enables two operators to wrap over 43,000 sandwiches and pastries per 24-hour day. Other benefits include a more sanitary package, product protection, and improved working conditions.

INDUSTRIAL catering has become big business in areas where plants number in the hundreds or thousands. The Tas-Tee Catering Co., Cleveland, serves 45,000 workers in over 450 plants every day. The company wraps 12,000 sandwiches, 5000 cakes, 2500 pies, 12,000 donuts and 12,000 cookies daily. This is in addition to hot food which is also prepared.

A little over a year ago, an automatic machine was installed to

wrap all sandwiches and pastries. With previous methods, all products were hand-wrapped. Production at that time was from 70 to 100 units per operator-hour, depending on the size and shape of the product.

Castered Equipment To Wrapping

With the wrapping machine, two girls turn out 3600 units per hour in a variety of kinds and shapes.

This amounts to an hourly production increase of 1000 per cent.

Sandwiches are made on a 20-foot-long table in the center of the wrapping room. They are placed on trays which are inserted in skeleton type castered racks, six feet high. A rack, holding 28 trays, is rolled to the wrapping machine where two trays at a time are placed on a waist-high castered feeding table. Pies, cakes and other pastries are brought from the bakery on similar mobile racks.

Flat "U" paper boards are placed in the magazine of the machine, and are fed by fingers against flared guides which fold the scored sections of the boards. The boards next drop into chain-mounted carriers. An operator places the product to be wrapped onto the boards as they pass by.

As the products move along they trip a switch, ejecting a section of cellophane which is wrapped around each unit. The box is centered by two guides and passes onto a platform where it is raised and fed into the heat seal unit. Here the ends and bottom of the wrapper are secured. Wherever possible, sandwiches are wrapped without a board. This is only done, however, when they have enough rigidity to allow automatic wrapping.

Labels are fed from a roll through a stamping plate which affixes the price and code number. The label

OPERATOR AT RIGHT feeds pastries into machine. Girl at left places wrapped units into trays.

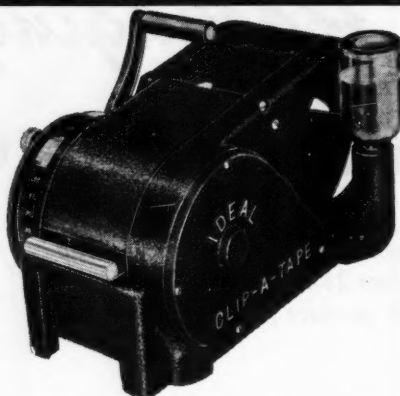


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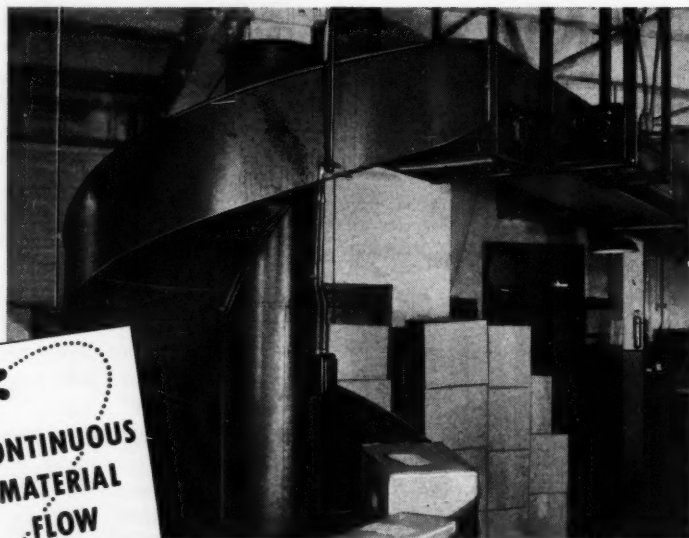
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is attached to the cellophane by another heat seal unit, contained in a pair of rollers. The stamping plates are changed for different items.

The packaged products move on to a five-inch-wide belt conveyor which feeds to a gravity roller conveyor, then to a table where a second operator places 60 to 100 units into a drawer. These drawers are put on the original skeleton racks and transported to the stockroom, where they are placed in mobile cabinets for movement to the shipping area.

When sandwiches are wrapped, they are fed from the roller conveyor onto a powered portable belt conveyor. They travel to two operators who place them into drawers. This second conveyor is necessary for sandwiches because of the high volume.

Improved Methods Bring About An Improved Package

The machine is adjusted for different size products, and can accommodate units up to 10 inches wide. The only other change necessary is regulating the machine to eject different lengths of cellophane.

Besides the saving in wrapping time, the machine has effected many other improvements. Packages of uniform size are now obtainable; the machine provides a sanitary finished product; labels are stamped automatically and do not require hand-placing; the machine-wrapped package provides better protection for the product, especially in the case of frosted cakes, and pies. Lastly, simplified job requirements have meant better personnel relations.

Better, Bigger Directory

New, improved features will be incorporated in the 1949-1950 FLOW Directory. More definitions and sketches; revisions for easier and more complete reference. Copies are \$5.00 each.

FOURTH ANNUAL INDUSTRIAL PACKAGING AND MATERIAL HANDLING EXPOSITION . . .

(Continued from page 72)

a number of foreign countries. A sizable representation from Canada was included.

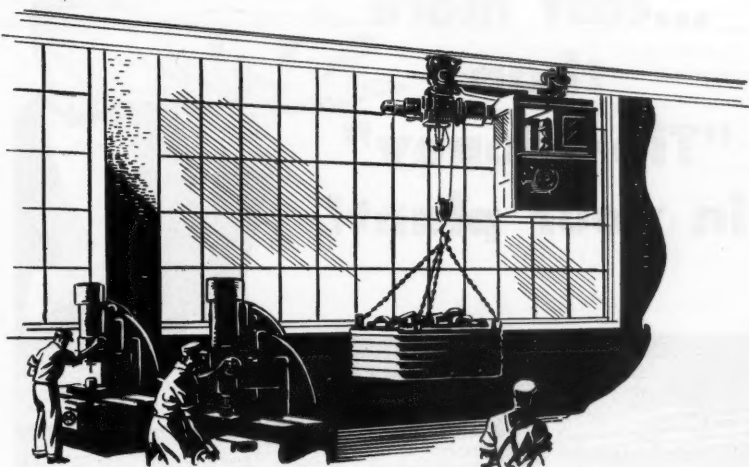
The program of the 1949 exposition will be enhanced by the active cooperation of Wayne University, Detroit. This constitutes the "Institute" activity of the exposition, which will include 16 specialized discussion sessions, lectures and panels. The schedule for this part of the program will extend from October 3 through October 7. Speakers have been chosen from various industrial fields, retail management and the business press.

Another outstanding program feature is a Protective Packaging Competition, which is being sponsored by SIPMHE with respect to all types of export containers. It is hoped that the competition will stimulate many to present new ideas on packaging materials and methods. The packaging displayed will be that actually used by exporters, and this event will therefore be of considerable practical value. Information regarding the competition should be obtained from the Society, whose address is given below.

The SIPMHE, sponsor of the exposition, has shown a marked growth during the four years of its existence. Its national membership now totaling about 1200 members represents more than 800 companies.

Write for details and registration blanks to the Society of Industrial Packaging and Material Handling Engineers, 20 West Jackson Boulevard, Chicago 4, Illinois. Those planning to attend are urged to inquire early about hotel accommodations. National headquarters of SIPMHE in Chicago is prepared to give conventioners all necessary assistance in this respect.

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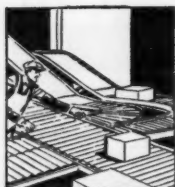
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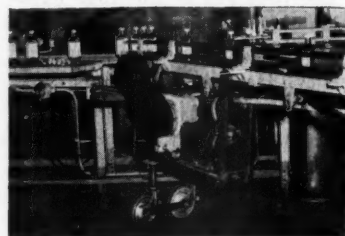


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tance Cone-Drive geared speed reducer. Power is transmitted to the conveyor belt by chains. Non-pivoted sections of conveyors are also driven by synchronized speed reducers from a common line shaft which is also connected to the bottling machine. Normal operating speed is 80 FPM.—*Courtesy, Michigan Tool Co.*

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FOR SALE

FOR SALE—Surplus Barrett-Cravens platform type lift trucks. Platform—42 inches long, 24 inches wide, 9 inches high in low position. Equipped with floor saver wheels. Slightly used. Excellent condition. Price f.o.b. Memphis—\$95.00 each. Grady W. Jones Company, P. O. Box 4101, Memphis, Tennessee.

CAR SPOTTER SALE: Electric Car Puller Hoists complete with Timken Tapered roller bearings, bronze work gear, sturdy steel base, vertical capstan; totally enclosed ballbearing motor. (3 phase, 60 cycle, 220-or-440-volts—other currents available). Speed approximately 40-ft. per minute. *Model 5-BB (5HP) 5000 lbs. Starting pull—\$388; *Model 7-BB (7½ HP) 7000 lbs. starting pull—\$488; *Model 10-B (10HP) 10,000 lbs. starting pull—\$587. Bernstein Brothers, Manufacturers-Distributors, "Since 1890" Pueblo, Colorado.

TOWMOTOR Model LT-60 gas-power lift truck, 4000 lb. capacity, 108" lift, pneumatic tires, in good condition. Blackwell Zinc Co., Blackwell, Okla.

TRUCKMAN — Model "D". New. Equipped with Briggs-Stratton A.P. Motor. Substantial discount. Rocky Mountain Warehouse, 19th & Wazee St., Denver 2, Colorado.

"PALLET"—SALE

3800 Pallets 30" x 54" Hardwood with Helyx Cement Coated Drive Screw Nails—2" x 4" x 30" Stringers and 1" x 6" x 54" Deckboards. Twelve Months Old—Price \$1.50 Per Pallet.

2000 Pallets 30" x 72" Hardwood with Helyx Cement Coated Drive Screw Nails—2" x 4" x 30" Stringers and 1" x

6" x 72" Deckboards. Twelve Months Old—Price \$2.25 per Pallet.

LEHIGH WAREHOUSE & TRANSPORTATION COMPANY
98 Frelinghuysen Ave.
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POSITION WANTED

GRADUATE CIVIL ENGINEER — Material Handling and Warehousing experience: 5 years shipbuilding, 3 Navy Stevedoring, 2½ Paper Industry. To organize and supervise material handling system. Starting salary \$5500 —Now Employed. Box 9249.

REPRESENTATIVES WANTED

REPRESENTATIVES WANTED: Manufacturer of overhead cranes, monorails, etc., wants representatives in

certain New York, Minnesota, Michigan, Pennsylvania, Indiana and Middle Western territories. Write giving details your organization and previous experience in the field, if any. Box 9149.

EQUIPMENT WANTED

WANTED

Fork Lift Trucks Krane Kars
Hand Lift Trucks Skid Platforms
Pallets Conveyors

We pay high prices for
Used Handling Equipment

A & A MACHINERY CORP.
1627 Flushing Ave. Brooklyn, N. Y.

INFORMATION WANTED

WANTED TO BUY A MAILING LIST

of companies now using
ELECTRIC INDUSTRIAL TRUCKS

This list can consist of companies
in either this country or, abroad.
Box 753, 1474 Broadway, N.Y.C.

Don't Overlook Savings From Yard Efficiency With

ROUSTABOUT CRANES

The fast tractor-footed load hustlers

- Rugged, maneuverable, the answer to efficient yard organization—make those wide open spaces pay! Winter and summer, indoors but especially out, versatile Roustabouts make 2 men a whole crew, keep things moving, avoid costly delays. Wheel or crawler type, hook or magnet loads to 7½ tons, built for years of overwork. Make your yard contribute to profits, too... write for the money-saving facts, today!



Write to Dept. C-5



HUGHES-KEENAN CORPORATION

DELAWARE, OHIO, U. S. A.

Load-Handling Specialists since 1904

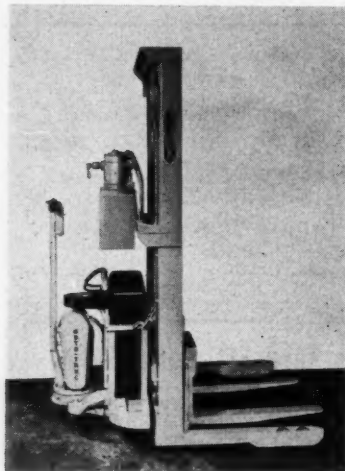
NEW

PRODUCTS

For additional information on these products, write Dept. 5, Flow Magazine, 1240 Ontario St., Cleveland 13, or use postcard bound into this issue.

HI-LIFT WALKIE TRUCK

NP1—The Moto-Truc Co. has introduced new developments in the design of its Motorized Telescopic Hi-Lift Walkie Truck. New features include 2" underclearance from bottom of outrigger to the floor; hydraulic pump and tank are replaced above the battery, and the corner of the battery carrier is rounded, permitting a six-in. reduc-

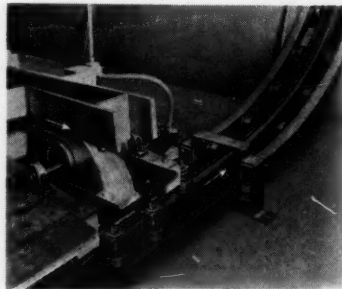


tion in turning radius. The distance from back of forks to front of motor unit is only 33 ins. Capacity: 4000 lb. up to 80" lift and 2000 lb. up to 144" lift, depending on size of outriggers and fork width and length. The unit is said to operate in a six-ft. aisle with a 36"x48" pallet. The roller-type handle is turned for two speeds forward and two speeds in reverse. Push buttons in the ends of the handle control the hydraulic lift.

ZIPPER BELTS

NP2—Zipper belts are being manufactured by the B. F. Goodrich Co. for Stephens-Adamson, manufacturers of the Zipper belt conveyor. This type of belt is designed for a conveyor-elevator system, which can handle breakable materials gently and without contamination. It is adapted for handling bulk foods, chemicals, coal or any granular, flaky, pulverized or small lump material. These belts are adaptable under limited space conditions, since they may be installed horizontally,

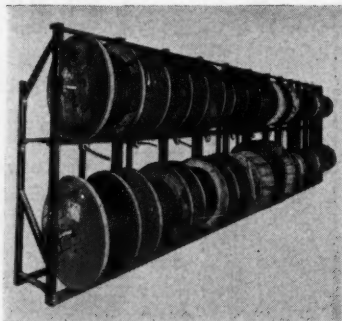
vertically, on a slope and around curves. The rubber teeth on the belt



can be locked or unlaced with the use of rollers which operate on the same principle as the tab on a slide fastener. According to the release, the operation of this belt is noiseless.

REELED WIRE AND CABLE DISPENSER

NP3—Unistrut Products Co. has devised equipment for handling reeled wire and cable. The company's ad-



justable and reusable double tiered reel rack is designed for unreeling, metering and all around handling of this material. The racks are adjustable for charging requirements, and are said to release floor space.

FOR REMOVING ANCHOR PLATES

NP4—A new tool for fast, easy and clean removal of strap ends, anchor plates, etc., in cleaning freight cars is now available from Signode Steel Strapping Co. The tool consists of a bar with a strong ratchet head and a pry-bar end. It is 36½" long and weighs 6½ lb. This ratchet tool draws

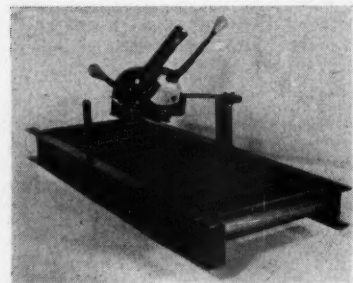
out the nails as it lifts the plate. There is not splintering of the wood on either the car side walls or the floor. Accord-



ing to the release, where the stub ends of the strap are short, they can be removed with the pry-bar end.

CONVEYOR STRAPPING UNIT

NP5—Designed for adapting a packaging conveyor to a strapping line is this Acme Conveyor Strapping Unit, manufactured by the Acme Steel Co. Different models are available to suit varied needs. Each unit consists of a roller section with a rigid mount and quick-change bracket for the strapping tool. The installation is possible either

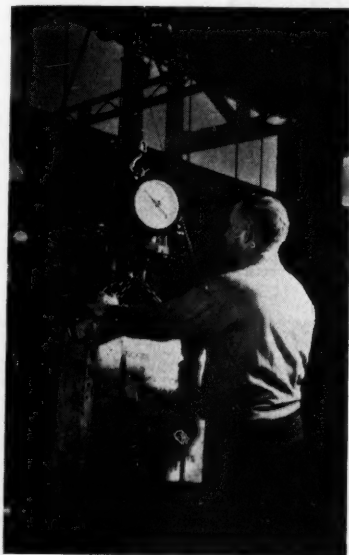


in the main conveyor line or at a right angle to it. The unit may be counter-sunk in a packaging table or bench. The model pictured, No. E10A3, has two vertical stops on the front edge. These stops are adjustable and act to line up the individual pieces in the bundle. The stops also permit a bundle with a minimum width of six ins. to be

places in an advantageous position for the strapping operation.

CRANE SCALE

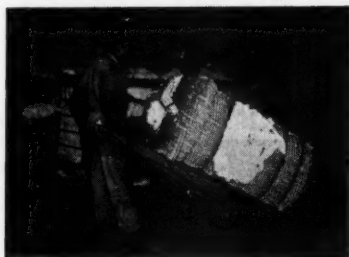
NP6—A new type self-contained hydraulic crane scale is manufactured by The Baldwin Locomotive Works. Loads are transmitted by a cell to precision



type tube, the deflection of which moves the pointer on the dial. The unit may be used indoors or outdoors. Crane scales are available with 13 scale ranges from 0-1000 to 0-30,000 lb.

TRAILER ATTACHMENT FOR HAND TRUCK

NP7—The Dohogne Co. has introduced a trailer attachment which bolts onto a hand truck and consists of a third wheel, coupling bars and a coupling. When the vehicle is used as a hand truck, the coupling arms and the third wheel slide down under the truck

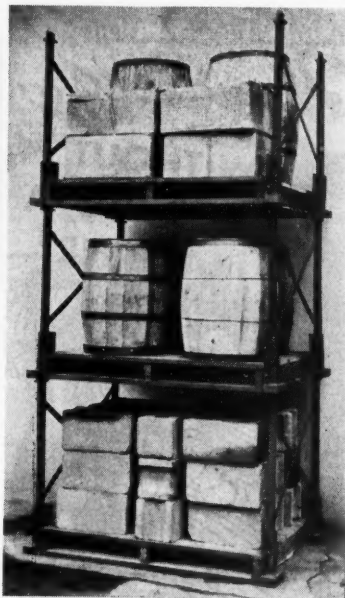


out of the way. After the load is placed on the unit, it is placed in a horizontal position and automatically coupled to other similar units. The wheel and coupling arms slide out and the hand truck becomes a trailer. Any number may be used, it is said. Originally designed for the cotton warehouse industry, the load carrier is claimed to be applicable to many other types of

products. Motive power may be supplied by tractors or other power vehicles. The picture shows the unit used as a hand truck with the third wheel visible at the left of the two front wheels.

STACKING PALLETS

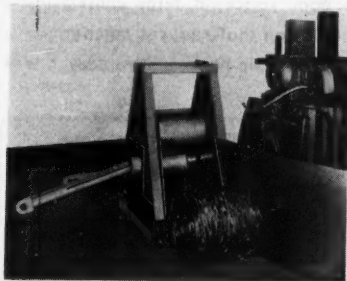
NP8—The Borne Co. has introduced a line of steel and wood racks designed for storing and handling unwieldy products. The racks are designed to fit present wood pallets, or are furnished complete as shown in the photo.



Pallets are attached to the rack with eight carriage bolts. Steel work is painted gray. The racks fold into flat, compact units when not in use. Models are built according to pallet size, strigger length and clearance required between pallets.

SPINDLE TYPE SCRAP BALER

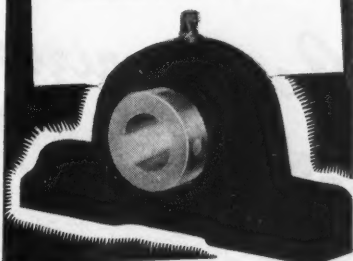
NP9—A metal scrap baler, manufactured by Allied Steel and Conveyors, Inc., forms a compact roll of scrap strip



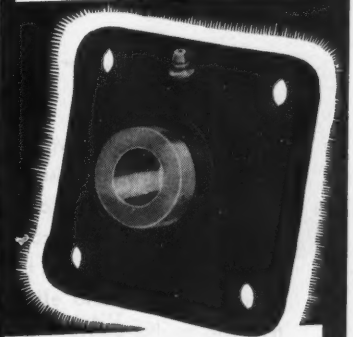
from steel plate shearing. The electric power driven equipment winds up a 400 lb. steel strip bundle approximately 19" in diameter and 19" high in a few

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**BALL BEARING
PILLOW BLOCKS
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FLANGE UNITS**



These bearings are machined, hardened and have unground raceways. The castings are accurately machined. They are designed to carry light loads at speeds up to 1,000 R. P. M. Heavy duty cast iron housings with grease fitting are provided. Felt seals give ample protection for the bearings.



Roberts Pillow Blocks and Flange Units may provide anti-friction bearings suitable for your application at lower cost. Ideal for conveyors and farm machinery. Write today for catalog, engineering advice, and prices. Territories open for agents, distributors and dealers.

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MACHINE WORKS
A DIVISION OF MINNESOTA BEARING CO.
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minutes. The baler has a tapered winding spindle direct-connected to a speed reducer driven by a five HP motor. One end of a "lead-in" strip bent over (hook form) at each end, is hooked to the scrap at random and the other end is hooked into a spindled groove. Set in motion, the scrap is dragged in and tightly wound up on the spindle. One man handles the entire baling operation. Once hooked into the spindle groove, the mass of scrap is dragged into the baler box and winds around the spindle without interruption until a full bale has been wound.

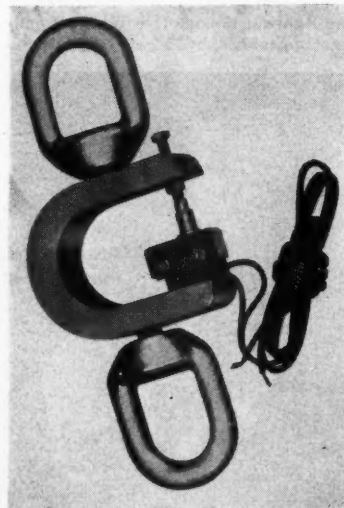
**CIRCLE NUMBERS ON
THE CARD AND MAIL!**

NEW BATTERY LINE

NP10—The Gould Storage Battery Corp. has announced a new line of motive power, diesel-starting and railroad air conditioning and car lighting batteries. The new "Z"-plate line introduces a grid resulting from years of laboratory research into lead porosity phenomena and grid casting techniques. According to the release, the company developed new casting rates and new mold-temperature control techniques which reduce grid porosity from 85 to 90 per cent, as well as vulnerability to sulphuric acid attack. This is claimed to result in longer life and better electrical characteristics.

TO PREVENT OVERLOADS

NP11—Designed to prevent overloads on hoists or cranes is this Dillon Dyna-Switch, manufactured by W. C. Dillon & Co. The unit slips onto the hoist or crane hook and the load is lifted di-



rectly beneath it in the usual fashion. The "U"-shaped tool steel bar of the switch opens and closes the circuit of a micro-switch as loads are lifted. Normally, the circuit of the switch is always closed when loads are being lifted. If the hoist capacity is exceeded, the circuit automatically opens, cutting out the motor and thereby preventing the operator from making the lift. The circuit remains open until the operator presses the switch to reverse. He must then remove the excess load before the hoist will pick up. Hoist motors up to $\frac{3}{4}$ HP can be handled directly by the Dyna-Switch, while all higher capacities are worked through an intermediate relay.

**CIRCLE NUMBERS ON
THE CARD AND MAIL!**

COMPACT FORK TRUCK

NP12—The Mercury Mfg. Co. has announced a new "Jeep" fork truck design. It was created to meet the

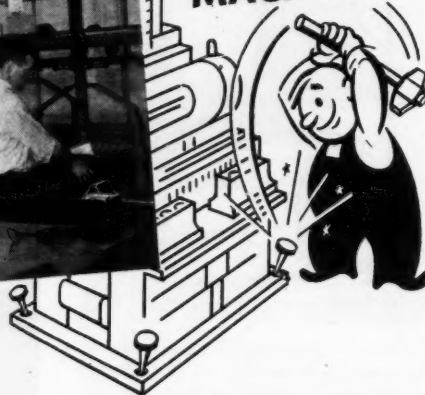


demand for an extremely compact, maneuverable chassis to operate on small

Conveyorized Handling...



**WITHOUT
MOVING A
MACHINE!**



The most flexible conveyor of all . . . the MHS Monoveyor . . . can be tailored to your existing facilities with minimum plant layout changes. Going around corners, through walls and between floors, this monorail conveyor can direct materials flow to and from machines and processes in their present locations; you can effect a smooth changeover to efficient handling with minimum expenditure and no shut-down.

Monoveyor does not require extra floor space; it turns unused ceiling area into a profitable plant addition that reduces number of times parts are handled, decreases work-in-process inventory, and lowers unit cost of product handled.

Let our engineers show you how to cut handling cost on your present layout. Bulletin M-3 gives full details. Yours for the asking.

All types of handling equipment—complete engineering service on materials handling problems.



MECHANICAL HANDLING SYSTEMS, INC.

Manufacturing Engineers

1820 NANCY AVENUE

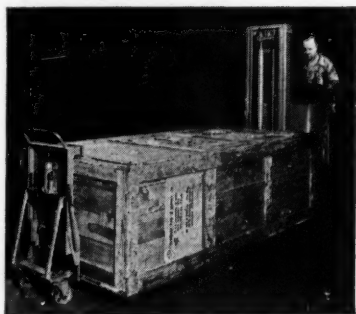
DETROIT 12, MICHIGAN

Offices in Principal U.S.A. Cities

elevators or in congested areas. The new model has a reduced wheelbase of 33" and the vehicle length has been decreased so that the overall length when carrying a 48"-long pallet load is only 103 ins.

ROL-A-LIFT

NP13—Long, heavy crates, export boxes and similar bulky objects up to 30 ft. in length are moved safely and economically by means of a new lifting and rolling device. The Elwell-Parker Electric Co. has announced it as a coordinating unit for use with its fork trucks; the device is built by Skarnes Engineering & Supply Co. The attachment is especially useful for loads ranging up to 8000 lb. and is designed for use in factories, warehouses, stores,



freight depots, cars, ships and docks. Rol-a-Lift combines a lifting and rolling mechanism in one unit. It is built in four models, all hand-operated. The heavy-duty size for loads up to 8000 lb. is 43 ins. high, weighs 200 lb. It has a pair of handles; a pair of forks five ins. long, 16 ins. apart, and a pair of swivel-type wheels five ins. in diameter. A hydraulic lift jack is mounted on the steel frame. Swivel wheels on the Rol-a-Lift enables the power truck to push and steer the load (with fork inserted under the opposite end).

PHOTOELECTRIC COUNTERS

NP14—Photoswitch Photoelectric Counters, manufactured by Photoswitch Inc., consist of a photoelectric control, light source and electric counter. The only equipment which is located at the point of count is the control and light source. One or more electric counters (containing the counter face and reset knob) may be placed at any convenient location and wired to the control. The equipment is designed for use in the beverage, brewery and dairy fields; for counting on loading chutes and conveyors; and for freshly painted, hot and small objects. It may also be used for counting textiles piece goods and leather items as well as for selective counting by height

and length. The lens of the device may be adjusted for very small objects.

SAFETY CHOCK

NP15—A new type wheel chock for use in loading and unloading large truck trailers has recently been introduced by the Planet Corp. Weighing 6½ lb. and measuring eight ins. high, the all-welded steel unit has been designed by safety engineers to hold trailers securely against loading docks and prevent dangerous up-ending between docks and trailers. According to the company, the chock's non-slip safety feature is achieved from its one-piece

steel tread plate, formed to fit the radius of trailer tires and an extended shoe on the back which prevents slipping on pavement or ice and snow. Its all-steel edges are claimed not to peel or chew away. Added safety features include painting the chock high-visibility yellow.

SLIDER BELT CONVEYOR

NP16—The Coburn-Foster Conveyor Co. is offering line #101 of Slider Bed Belt Type Conveyors, made of interchangeable parts. All moving parts have anti-friction bearings. The conveyors are designed for use in factories,

A *NEW* WAY TO Raise Production

with *STEEL-PARTS* STEEL BELT Elevating CONVEYOR

Now . . . a NEW way to raise production and employee efficiency . . . to cut unit cost and operating space! **STEEL-PARTS** new **ELEVATING** steel belt conveyor is unbeatable for sending parts or packages from floor to floor in a continuous flow . . . lifts packages up or down . . . loads or unloads at desired height. Incorporates all of the famous features of **STEEL-PARTS** standard models. Let **STEEL-PARTS** engineers make specific recommendations concerning your materials handling problems. Mail the coupon today!



ENGINEERING DATA

- **BELT**—heavy 18 gauge steel.
- **WIDTH**—12 inches to 30 inches.
- **LENGTH**—5 feet to 30 feet.
- **SPEED**—Up to 50 feet a minute.
- **H.P. REQUIRED**—½ to 2 horsepower.

- **LOAD LIMIT**—(recommended) 50 lbs. per arm. This can be exceeded 50%.
- **PULLING LOAD LIMIT**—1000 pounds.
- **ARMS**—18 inch maximum length. Can carry a load up or down.

STEEL-PARTS
MANUFACTURING CO.

DIVISION OF BLACKSTONE
MANUFACTURING COMPANY

STEEL-PARTS MFG. CO.
4630 W. Harrison, Chicago, Ill.

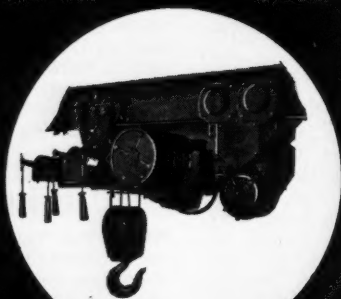
Please send me complete information including engineering data and specifications on your Steel-Belt Conveyors.

Please have your representative call to discuss our specific materials handling problems.

NAME _____ POSITION _____

FIRM _____ ADDRESS _____

CITY _____ STATE _____

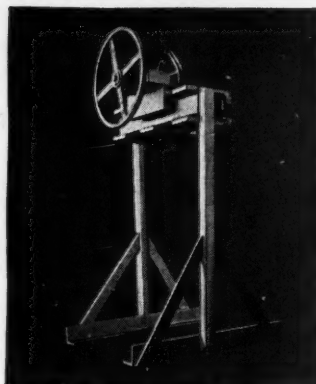


ELECTROLIFT

makes light work

of materials-handling. One man merely presses a button to get this worm-drive electric hoist to lift loads — up to 6 tons — and move them to the desired location. ElectroLift operates quietly and with very little power. For complete information on models to meet your capacity, speed and plant layout needs, phone or write your nearby ElectroLift representative listed in the classified telephone directory. Or write to address below.

ELECTROLIFT, INC. 30 Church Street, New York 7, N. Y.



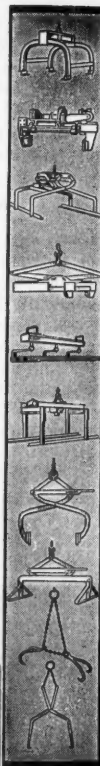
Mansaver Pallet Handler

If you have no fork truck but do have a monorail system, you can still handle and stock pallets with Mansaver Grabs. The one shown has legs which go under the pallet and various pallet widths are readily obtained by turning the hand wheel. Other Mansavers are available if this one does not fit your condition.

COMPLETE YOUR CRANES WITH

MANSAYER GRABS

Mansaver Industries, Inc., 3103 East St., New Haven, Conn.



FOR 57 YEARS BUILDERS OF QUALITY MATERIAL HANDLING EQUIPMENT



CAR UNLOADERS for unloading hopper bottom cars. Models 483-484. Belt or Drag.



FLAT or TROUGH BELT CONVEYORS for handling coal, coke, sand, gravel, etc. to trucks or piles. Models 481 & 482.



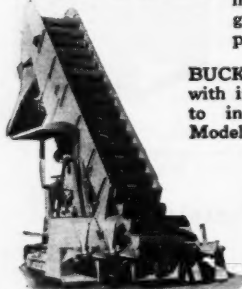
DRAG CONVEYORS for handling all sizes of coal and coke. Model 486.



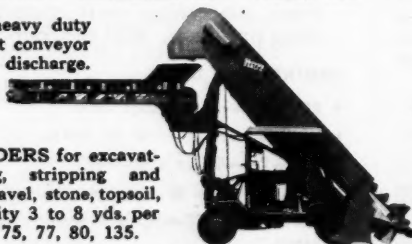
PACKAGE CONVEYORS for handling bags, boxes, crates, cartons, hampers, etc. Model 485.



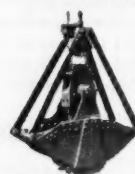
SECTIONAL CONVEYORS made in easily assembled individual sections. Portable or stationary for handling all bulk materials. Model 487.



BUCKET LOADERS, heavy duty with integral swivel belt conveyor to increase zone of discharge. Model SBC.



BUCKET LOADERS for excavating, rehandling, stripping and loading sand, gravel, stone, topsoil, coal, etc. Capacity 3 to 8 yds. per minute. Models 75, 77, 80, 135.



Heavy Duty or Light Duty Clamshell Buckets for high speed excavating or rehandling.

For further information, write, phone or wire. Experienced Hais representatives are located in all principal cities.

GEORGE HAISS MFG. CO., INC. division of **PETTIBONE MULLIKEN CORP.**

141st to 144th St. on Park Ave. NEW YORK 51, N. Y.
Phone Mott Haven 9-3650

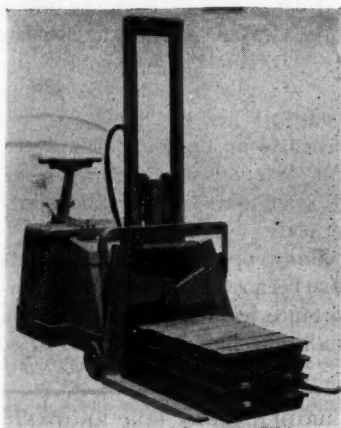
4700 W. Division St. CHICAGO 51, ILL.
Phone Spaulding 2-9300



warehouses and large stores. Lengths are available up to 100 ft.; widths eight, 12, 18, 24 ins., and up; elevations adjustable from 24 to 30 ins., and 30 to 36 ins. Belt speeds are 36 FPM or 60 FPM. The frame consists of punched angle iron with many interchangeable parts.

GRAB FOR POWERED HAND TRUCK

NP17—The Yale & Towne Mfg. Co. has announced the first in a series of special attachments for its line of



Worksavers, battery powered hand trucks. Known as the "Bunnyhugger",

the unit is designed to handle bales of fabric, large crates, or pigs. To pick up loads, the equipment is maneuvered so that the load is between the forks; the operator then manipulates a control-lever causing the forks to pinch the load. The forks are then lifted and the load transported or tiered as desired. This tilting fork model has a capacity of 3750 lb., travels at two MPH under full load, and the mast tilts 21° in 10 seconds to center the load. Overall dimensions of the truck, not including the forks, are 35" x 67 1/4". Overall mast height is 83 ins.; fork elevation is 56 1/2 ins.

RUBBER-TIRED CRANES

NP18—The Lima Shovel and Crane Division of Lima-Hamilton Corp. has announced three new rubber-tired machines: Types 34-T, 34-M and 604-M. Model 34-T is mounted on a truck chassis with independent power (two engines, one for rotating assembly, one for propelling the carrier). Standard equipment includes a five-speed main transmission and two-speed auxiliary transmission for 10 speeds forward and two reverse. The type 34-M is a self-propelled unit with one engine mounted in the rotating assembly. It supplies the power for all operations, including propelling in either direction. The Type 604-M may be truck mounted. One engine, mounted in the rotating assembly, supplies the power for all

the operations, including propelling in either direction. This unit has a lifting capacity of 85 tons.

FLOOR-SURFACING MATERIAL

NP19—A new floor surfacing material designed to resist severe conditions has been announced by United Laboratories, Inc. The product, Quartex, is used for surfacing floors subjected to alkalis, oil, grease, fats, and many floor destructive elements commonly found in industrial and institutional plants of all kinds. This material is said to withstand severe conditions which are highly destructive to floors of asphalt and concrete. Applied directly over the old surface at a depth of approximately one-half in., Quartex is ordinarily said to be ready for use within 36 hours.

HAND TRUCK

NP20—A new all-welded hand truck, constructed of magnesium tubing, is now being marketed by the Penco Engineering Co. Specially designed for use in the beverage industry and in grocery warehouses, it is available with or without wheels. All models are designed with beveled edge toe-plates and have the "stair climber feature" for use in operation over stairs and curbs. Weights of models range from 13 to 14 1/2 lb., with wheel sizes from 6"x2" to 8"x1 1/2". Nose sizes are available from 5"x14" to 8"x14".

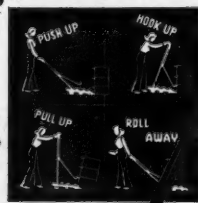
Don't be 1/2 safe

Let "George" haul your Tote Boxes

He's an almost automatic truck with a new handle-hook leverage principle that glides boxes onto truck easily, safely. You can use a battery of "Georges". Long life, priced right.

There's a "George" in your future

With apologies to you know who



LET "George" DO IT

Send for Folder F
ROLOCK Incorporated
Fairfield, Connecticut

**You don't have to be BIG
to be EFFICIENT!**



New UNLOADER-LOADER Team For All Materials — All Sizes of Plants

The new B-G 363 Unloader-Stockpile-Loader is an all-purpose machine; handles all bulk materials—up to 200 T.P.H. Also handles bagged and packaged goods. All new, heavy duty, highly portable! The 358 Hopper Car Unloader clears a car of material in 45 minutes! Positive, non-slip hopper-bottom car unloading for all bulk materials. Easy to spot over rails or in pits. Truck-towed portability.



Send for new Bulletin! On the 24" Belt Conveyor, Bulletin 363. On the Hopper Car Unloader, Bulletin 358. Address

Barber-Greene Company

Aurora, Illinois

AUTOMATIC DISPATCH SYSTEM FOR CORE SAND . . .

(Continued from page 30)

ingredient, cereal flour, is deposited in the skip hoist by hand (because of the very small amount).

The automatic dispatch unit consists of a revolving four-castered bucket encased in a steel frame and held in place on each side by a swivel-type socket. Motive power is supplied by a monorail tractor.

The bucket is lowered to the floor by two electric hoists, and pushed under the discharge spout of the muller, where it receives approximately 500 lb. of sand-mixture. The loaded dispatcher is then elevated to traveling position. The operator sets a switch (24 numbers on the dial correspond with the coremakers' benches) and sends the unit to the designated station.

The layout diagram shows the routes traveled. The benches are arranged in four parallel rows, each

covered by a 30-ft. section of monorail track. Another track running at right angles to the other four and two switches complete the system. Pull ropes are so placed that the operator may regulate the switches at the same time he dispatches the automatic unit.

Automatic Dumping and Return

The bucket stops at the designated bench, revolves 360 degrees and discharges its contents into a hopper installed above the benches of the coremakers, who control the flow of sand from the hopper as needed. When the bucket has returned to an upright position, the unit automatically returns along the same route to its original starting place.

Many operating improvements have been realized. Of primary importance has been the elimination of all shoveling.

BRIDLE-SLING FOR RECTANGULAR LOADS—A four-part bridle-sling provides a simple solution to the problem of hoisting such loads as sheet-steel, machinery, ship-to-shore cargoes, construction equipment and large rectangular-shaped loads like the basket-type conveyance illustrated.



This container carries fabricated sheet-metal sections from one part of the shop to another. It consists of an angle-iron frame and wire mesh body. The ends of the sling cables are permanently secured to the frame. Thimbles prevent wear at points where the cables engage the hoist hook. The hoist shown is a 1/4-ton wire-rope trolley-mounted unit. The load is raised and lowered by push-button control and is pushed along the trolley by an operator. A reel suspended from the ceiling takes up the slack of the electrical supply cable and eliminates dangling cords.—Courtesy, Yale & Towne Mfg. Co.

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Materials Handling Equipment

Designed for the Job!



Corrugated Products

for Added Strength—Less Cost

Streator Dependable's modern steel corrugation facilities give you the latest advantages in improved design and construction of materials handling equipment.

The corrugations act as reinforcing ribs, more than doubling the strength and rigidity of the units—at the same time eliminating needless weight and bulk. The result is vastly improved factory handling equipment that lasts longer and takes more abuse . . . and costs less.

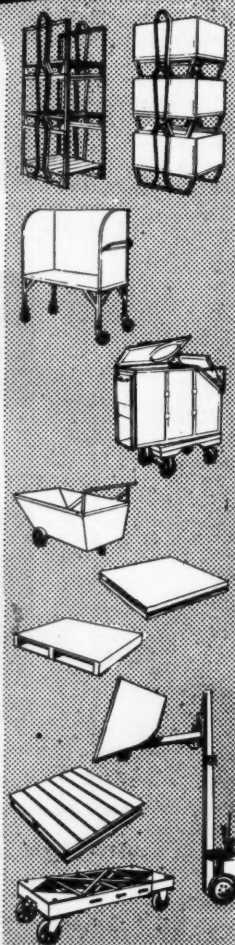
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Self-dumping hopper for use with power lift truck—one man can load, transport and dump.

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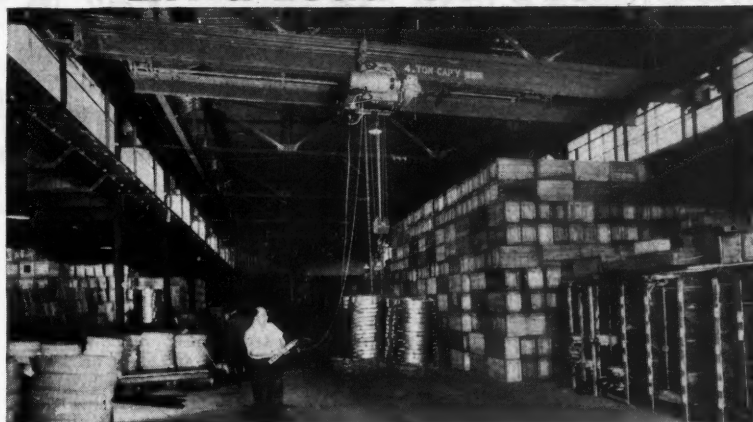
THREE-TON WASTEBASKET — Originally built for scrap disposal at a major automobile plant, this three-ton trash-truck rolls on a spring-mounted chassis and is hinged at the bottom for lowering the side during dumping. Lifting lugs on one side are for hoist handling. The container is thus raised



and the contents discharged from the opposite side. It is available in a number of variations of chassis and running gear. The running gear shown consists of 18" x 5" pressed-on rubber tired wheels. The unit's outside dimensions are 4' x 10' x 42" with a capacity (the model illustrated) of 6000 lb.—Courtesy, Service Caster & Truck Corp.

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The sheer good performance an Abell-Howe crane gives year after year lifts crane worries off your mind for good. Down to the smallest part, every Abell-Howe Crane is built from finest materials. Into its design and construction goes the "know how" of an organization which has concentrated on dependable overhead equipment for 25 years. From every standpoint, investment cost as well as long-pull, worry-free performance, it will pay you to look into the equipment and service Abell-Howe offers. Write us about your crane problems.

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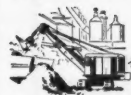
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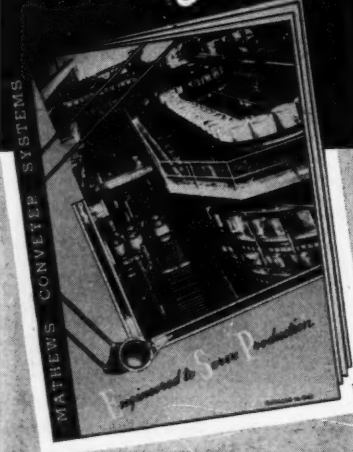
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● These 32 pages contain specific examples of how handling costs can be cut . . . substantially. Show conveyers at work moving cartons, coils, boxes, cases, parts and many other products. Illustrate roller, wheel, live roller, belt, chain, overhead trolley, and elevating conveyers, and special conveying machinery.

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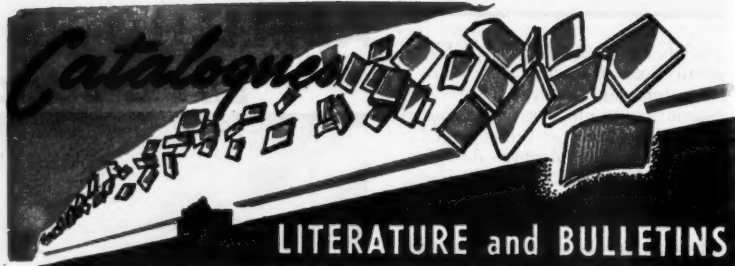
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American and Canadian Cities



The publications featured on these pages were written by experts. They are FREE publications. To obtain these use the postcard bound into this issue.

25—Centrifugal Pumps . . . Allis-Chalmers has released its revised handbook on the care of all makes of centrifugal pumps. The 16-page publication gives the "how" and "why" of pump construction and data on maintenance. The book tells how to figure head, and carries tables to help determine total friction loss. Causes and cures for various sources of troubles are offered along with a new maintenance timetable. Other subjects covered include little known facts about cavitation and how to protect pumps against it; water's role as a lubricant in pumps, and common mistakes in packing stuffing boxes. The text is fully illustrated.

26—Heavy-Duty Casters . . . A four-page bulletin on its new line of forged-steel precision-type heavy-duty casters has been issued by The Bassick Co. The casters are available in 5", 6" and 8" diameter wheels. Photos are shown of the various component parts: the forged-steel top plate, heavy-duty main load bearing, one piece forged-steel horn with accurate bearing seat, thrust bearing, and slotted nut for adjustment, and forged-steel wheel. Illustrations and specifications are given for eight types of swivel and rigid casters. The back page of the bulletin shows seven different construction features of the super heavy-duty casters, both swivel and rigid. These casters are being used under loads as high as 10,000 lb. per caster.

27—Magnet Brake and Crane Hoist Control . . . Two closely related types of equipment, a d-c two-shoe, two-magnet brake and a new d-c crane hoist control are illustrated and described in bulletins issued by General Electric's Controls Division. The new brake is designed for use on steel mill drives, cranes, hoists, bridges, conveyors, and for general marine service. The new control is specially intended for use on whirley, revolver, gantry, and overhead cranes in steel mills, shipyards, on ore bridges, warehouses, and on loading and unloading towers. "Blown-up" photos show detailed construction of components and whole units. Charts give specifications, load characteristics and brake ratings.

28—Cranes . . . The Whiting Corp. is offering its new crane bulletin, Unit 71. It outlines three new features avail-

able on its cranes, which are: 1. Streamlined, Full-Vision cab. 2. Simplified magnetic controllers. 3. Fluid-drive (hydraulic couplings) on both bridge and trolley motors. The Full-Vision cab has been designed for the widest possible range of vision. By use of magnetic controllers, only low voltage is run into the cab. Hydraulic couplings (fluid drivers) have been successfully applied to both bridge and trolley drives. Pictures of components and complete models, engineering data and general operating information are included.

29—Shipping By Air . . . The ninth edition of the Hinde & Dauch data book, "How To Ship By Air In Corrugated Boxes," brings revised and up to date information on the economical use of Air Express, Air Freight and Air Parcel Post. This publication, one of the company's "Little Packaging Library" series, gives current regulations for all air shipments, and describes a number of typical case histories on new types of air shipping. Also included is a section on corrugated packaging materials which are designed for fragile items.

30—Powered Handling Equipment . . . Bulletin No. 24, issued by Lewis-Shepard Products, Inc., is designed for those who use or are contemplating using power equipment in their material handling operations. This bulletin covers the fields of Jacklift Electric Trucks for horizontal movement and Master JackStackers for both horizontal and vertical movement of material on skids and single or double faced pallets. Many different models of each style truck are shown, together with complete specifications, dimensional drawings and application photos.

31—Portable Conveyors . . . Lake Shore Engineering Co. has released an eight-page illustrated brochure, No. 495. It shows Tote-All lightweight, portable power conveyors for bulk materials and packaged goods. Included are application photographs, application and specification data covering bulk conveyors, package conveyors, combination bulk-and-package conveyors and special machines.

32—Returnable Shipping Container . . . Two types of reusable palletized

shipping containers are the subject of catalog sheets available from the Plycraft Fabricating Co. The first type has three hinged sides and a removable front and top. The pallet floor is $\frac{3}{4}$ "-5-ply plywood. Sides and top are constructed of $\frac{3}{8}$ "-3-ply plywood, reinforced with a series of cleats which are glue and staple fastened. The second type is constructed to allow the removal of all sides and the top. The sides are fastened at the bottom with retaining angles. Pallet bases of both types may be one or four-way. Photos of set up and collapsed containers are accompanied by specifications, general data and special features.

33—Gravity Conveyors . . . Conveyor Systems, Inc., is offering a four-page bulletin on its line of portable and permanent gravity wheel and roller conveyors. Photos show typical installations in a brewery, candy factory, and on a dock, both for unloading and loading. Portable and permanent sections, stands, curves, and other accessories are pictured. Engineering drawings give wheel spacing, layout of curves, and position of two and three-way switches. Specifications and operating data.

34—Baskets, Hampers and Trucks . . . A 24-page reference catalog is available from C. R. Daniels, Inc. It covers the company's line of baskets, hampers and trucks for use in mills, factories, laundries, hospitals, hotels and department stores. Each page is devoted to a particular unit with a photo and text on features and specifications of that model. Specific models are laundry and factory baskets for general use; castered baskets; shipping hampers; elevated baskets and trucks; square and steaming baskets; basket and truck liners; coal baskets and shipping bags.

35—Industrial Tape . . . Issue No. 11 of the Industrial Review, published by the Industrial Tape Corp., contains several informative case studies regarding the product. The tape is described in use in the automotive refinishing field during baking, spraying, etc. Another study contains information on its application to the protection of metal during the fabrication of sheet aluminum and sheet steel elements for refrigerators. Some of the uses for industrial tape, listed in the richly illustrated Review include, masking, stenciling, holding, sealing, reinforcing, identifying and packaging.

36—Marking Equipment . . . Base-Lock Type conveyor line markers and related marking items are featured in Catalog D, issued by Wm. A. Force & Co. Conveyor line markers are designed for imprinting changeable data on boxes and cartons. According to the release, construction makes coding, marking or dating a fast and positive operation. The units are equipped with an ink fountain and inking roller. Interchangeable rubber type is used for

speedy copy changes. Other units featured include bottom carton markers (located flush with the conveyor's carrying surfaces), side markers and top markers. Several photos of each unit are shown, together with descriptive copy of operating features. Other literature from the company contains information on industrial rubber type, stamping and marking equipment and accessories.

37—Ball Bearing Swivels . . . Designed to eliminate twisting and kinking in strung blocks are Miller Angular Ball Bearing Swivels, the subject of a folder issued by General Machine & Welding Works. The swivels are attached to the hook and designed to keep the load from spinning and from twisting the lines. They are said to make the placement of the load simpler, giving the operator greater control. They are also used on the dead end of strung blocks. According to the manufacturer, when used in this manner, they make stringing or restringing easier by automatically taking all the kink and twist out of the line. Swivels are available in a wide range of capacities, handling up to 23-ton working loads with a safety factor of more than five to one. Pictures, line drawings and specifications are included.

38—Load Bracing . . . The C. J. W. Corp. is offering a folder giving data on its Load-Set Weblock. The unit is designed to secure loads in trucks, airplanes, rail cars, boats and for industrial applications. The device enables the user to adjust pressure to the exact amount permissible, and is said to prevent any slackening or backlash after tightening. To tighten, the free end of the web is pulled and tension automatically locked at whatever maximum pull is exerted so that it is not necessary to "clinch" the free end of the webbing. To release, the end of the cam is pressed down, so the webbing is free to travel. Side plates are designed to shield the cam from accidental release during travel. Engineering and construction data are illustrated.

39—Profits from Inventories . . . The question of profitable inventory control is treated in a new booklet published by the Systems Division of Remington Rand Inc. It discusses modern methods of simplifying the management of stocks to prevent losses either from too much or too little. It shows why and how improved, modern inventory records reduce clerical costs and conserve executive time.

40—Equipment Catalog . . . A 72-page catalog of Packing Materials and Material Handling Equipment has just been published by the Stark Co.

41—Light Handling Equipment . . . An eight-page booklet is offered by The Menasha Wood Splint Pulley Co. It lists a wide variety of floor, box, wagon, rack and box trucks, and skids and dollies. Each item is pictured.

The 1949-50
FLOW DIRECTORY
of
**Material Handling
Equipment,
Machinery and
Accessories**



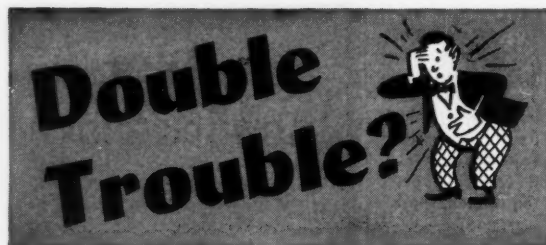
The only book which lists all types of material handling equipment, sources of supply both nationally and locally, a trade name index, manufacturers' catalogs, and engineering and technical data . . . 484 pages of invaluable information.

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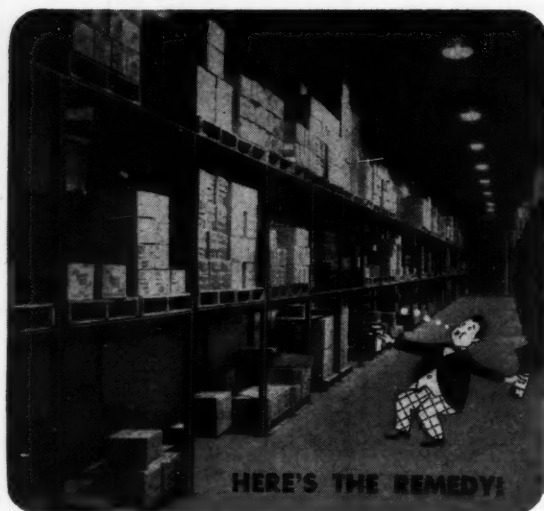


PROBLEM A:

How to stack uneven and fragile palletized loads.

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How to stack mixed loads without tying up low-level material.



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For every type industry. Stack palletized loads to the ceiling, safely, with these rugged, all-welded tubular steel racks. Easy to erect and move. Adjustable underclearance for varying height loads. No welding or cutting necessary.



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Literature Available From Advertisers In This Issue

(Check corresponding numbers on the enclosed card for the free literature listed below).

A-1. WHITING CORP. is offering Bulletin H-100B on its worm drive electric hoist.

A-2. STREATOR DEPENDABLE MFG. CO. will send information on its line of racks, self dumping hoppers and seats for industrial equipment.

A-3. FRANK G. HOUGH CO. Literature is available on the five models of Hough Payloaders designed to handle bulk materials.

A-4. ROTARY LIFT CO. Two catalogs on the company's Levelators and Leva-Docks.

A-5. ACME STEEL CO. "Savings in Shipping" tells how cost economies are obtained through the use of steel strapping.

A-6. EQUIPMENT MFG. CO. A catalog describing and illustrating its line of prefabricated pallet racks.

A-7. HARNISCHFEGGER CORP. Bulletin H20-4 on its electric hoists with capacities up to 2000 lb. (Use the card bound into this issue to get a copy.)

A-8. THE THEW SHOVEL CO. A folder on the applications of mobile cranes to various phases of industry.

A-9. THE ELWELL-PARKER ELECTRIC CO. E-P Reporter No. 7 gives information on the handling of hot metals.

A-10. JERVIS B. WEBB CO. will send you a catalog describing its line of overhead conveyors and accessories.

A-11. STEEL PARTS MFG. CO. A publication containing engineering data and specifications on its Steel-Belt conveyors.

A-12. ROURA IRON WORKS, INC. "You Can Save 50% Labor-Time" is the title of a detailed brochure offered by the company.

A-13. AEROL CO., INC. Data on its new differential-action rubber-tired powered pallet loader wheels.

A-14. BRAINARD STEEL CO. A catalog illustrates and describes the company's line of steel strapping and strapping accessories.

A-15. UNION WIRE ROPE CORP. Brochures on its slings, including safe working loads of nine different sizes.

A-16. C & D BATTERIES, INC. Catalog IT-515 contains illustrations and detailed data on its line of lead-acid batteries.

A-17. MAGNESIUM CO. OF AMERICA. Information is offered on the company's magnesium dockboards, hand trucks and barrel skids.

A-18. MATHEWS CONVEYOR CO. A 32-page book contains examples of how handling costs can be cut with various types of conveyors.

A-19. FAULTLESS CASTER CORP. Bulletin 156 gives data on caster applications and the company's line of casters. (Use the card bound into this issue to get a copy.)

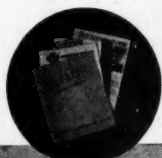
A-20. TRUSCON STEEL CO. Booklet No. P-70 covers its steel boxes and steel skids.

Detroit

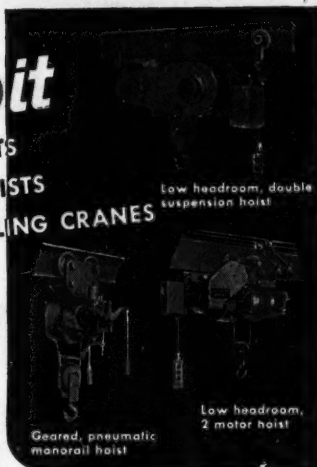
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A type for every purpose. Quick operating, efficient material handling units.

Give us an outline of your material handling problem. We will provide recommendations.

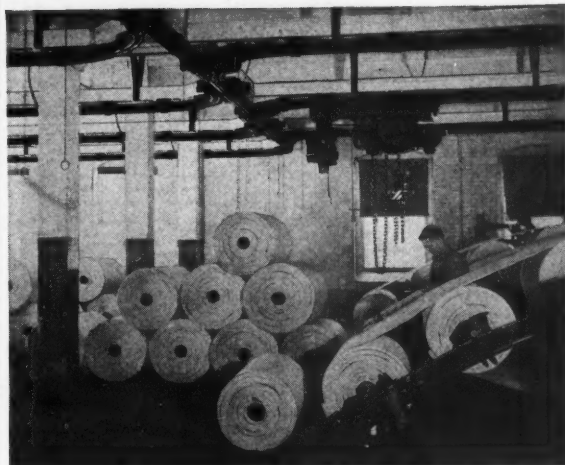


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REDUCE ACCIDENT HAZARDS

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If your processing operations call for lifting or moving of loads up to 3000 lbs., Coburn can eliminate many "back-breaking" problems.

The sectional design of Coburn Enclosed Overhead Monorail permits easy installation, rearrangement or extension, as required. It can be used with hand or electric hoist; does not obstruct floor space; requires very little headroom; permits easy spotting of work directly over machines.

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There is a full range of sizes and our experienced engineers are at your service.

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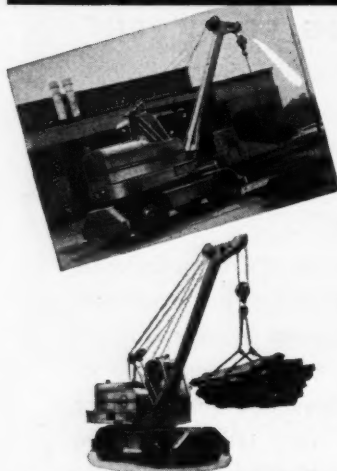
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Quickly Convertible to any other
Boom Attachment . . . Shovel . . .
Trencher . . . or standard Crane.

**Now...the UNIT 357
MOBILE CRANE with a
TELESCOPIC BOOM
6 BOOM POINT LEVELS IN 1**



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- It Has 1001 Uses

This Unit Telescopic Boom broadens the scope of your Unit Crane. The boom is easy to adjust. It can be extended from a minimum of 16 feet to a full length of 26 feet, in progressive steps of 2 feet each. Merely remove 4 bolts, set boom at any desired height, replace bolts and the machine is ready for action. It lifts—loads—and hauls from any point to any place in or out of plant. Gas or Diesel power. Write for literature.

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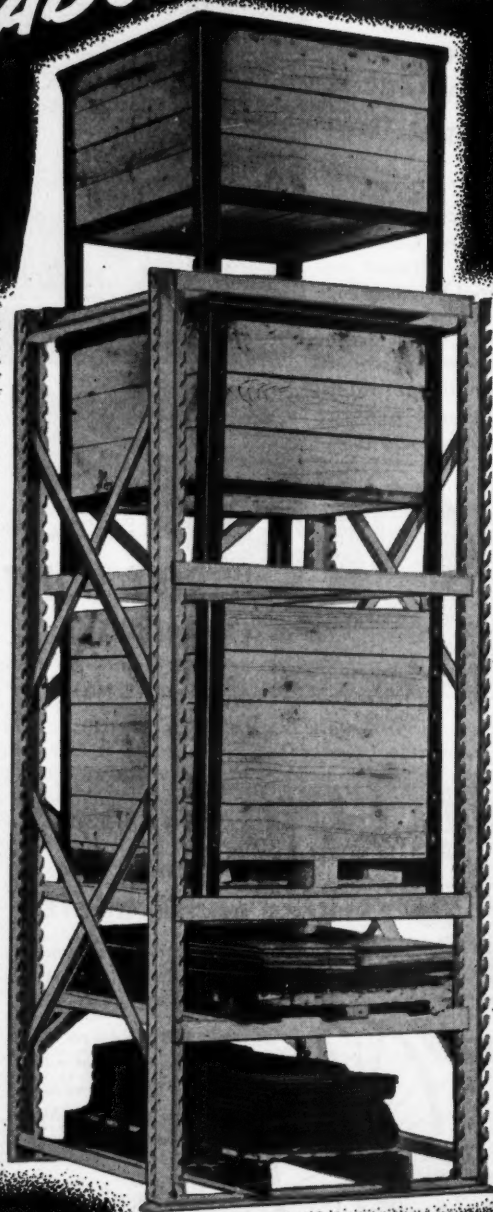
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This pallet rack is fully adjustable without the use of bolts or wrenches! Your fork lift truck can quickly and accurately position shelves to the proper spacing.

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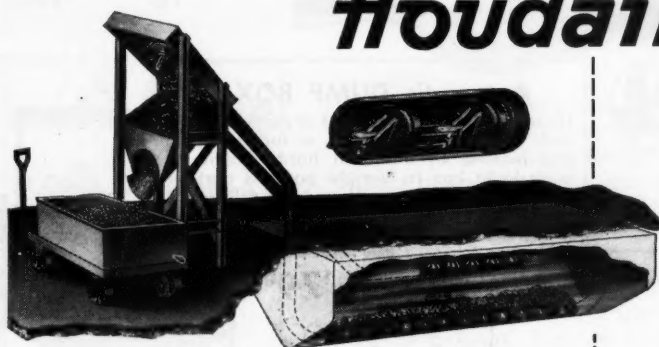
Ideas You Can Use

WITH this issue, the editors present the start of a new series of reports prepared for fall and later publication. As usual, the articles cover a wide range of operations and products—from frozen foods warehousing to core sand feeding, from flow in a copper tube mill to packaging sandwiches. "Refrigerated Warehouse Handling" (page 23) reports on the newest plant in this field. "A Box That Helped Solve a Breakage Problem" (page 73) gives the simple solution devised for shipping ceramic insulators. "How the Erie Keeps the Wheels Rolling" (page 32) describes flow procedures in a shop carefully planned for streamlined operations. "Gravity Conveyors In a Multi-Press Layout" (page 54) details some effective kinks, along with flow engineering data, which have been a boon to production. Note, also, the money-saving innovation presented in "Low-Cost Shingle Storage" (page 51).

Thus each issue presents a maximum of operation-tested ideas—ideas that stimulate your own ingenuity in the application of material handling equipment for improved production at lower unit cost.

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Cast Iron Dust and Chips
Aluminum Dust and Chips
Abrasive Sludge
Scale resulting from quenching, metal cleaning, steel rolling, aluminum rolling, brass rolling, copper rolling, wire drawing

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PLASTIC POWDERS

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Originally designed to handle sludge and waste matter in the metal working industry, the Houdaille Conveyor is being used to handle a wide range of applications in the materials handling field.

This automatic loading and continuous materials transport is adaptable to transporting any solid or fibrous material which will settle to the bottom of a tank or hopper.

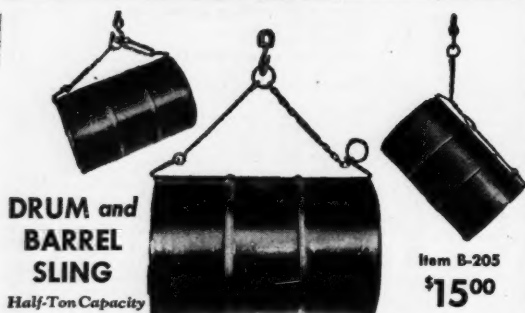
If you have a materials transporting problem, write to 100 Wabash Avenue, Lebanon, Indiana in care of

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Everything You Need in MATERIALS HANDLING EQUIPMENT



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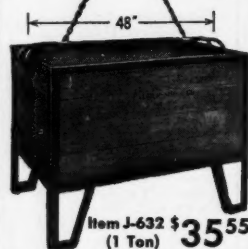
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Item B-205
\$1500

Will handle drum for draining purposes. Use for loading on or unloading truck and for general purpose handling. Will handle barrels, drums, kegs, anything with a lip such as on drum or barrel. Easy to operate . . . heavily welded chain, forged grab hooks. Weight 8½ lbs.

UNIVERSAL GRAB

Item J-631
(1000 Lbs.)
\$2890



Item J-632 **\$3555**
(1 Ton)

Use for picking up all types of heavy boxes, crates, bales or other loads where hooks may be used. Heavy, forged steel hooks with an adjustable spread of from 16" to 48". Adjustable for use where ceilings are high or low. Weight 27 lbs.



Item NS-288
\$5525

BARREL GRAB

For picking up any type of wood or steel barrel, box or container, from 40" diameter down to small nail keg size. Will lift up to 2000 lbs.

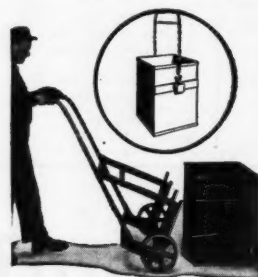
SHEET STEEL GRAB



3 ton capacity
Item NS-364
\$1500

5 ton capacity
Item B-704
\$22500

For handling sheet steel bundles. Holds sheets securely without slippage, distortion or damage to stock. Engineered and built for heavy industrial use.



SQUARE TRUNNION BOX & TRUNNION BOX TRUCK

Used for moving work in progress between operations. Box can be used with overhead hoist.

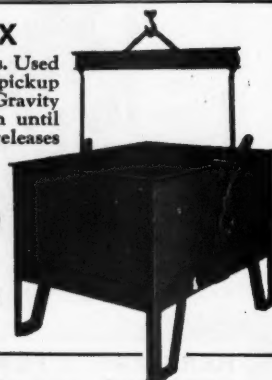
Trunnion Box (Minimum 10 boxes) **\$1865**
Trunnion Box Truck **\$4500**
Item B-290 Item B-268

Automatic DUMP BOX

Handles all types of material or parts. Used with hand, power or truck, or for pickup and moving by overhead hoist. Gravity latch locks box in upright position until ready for dumping—pull on latch releases the box—dumping is automatic.

Item B-465-B
Automatic Dump Box **\$7900**

Item B-465-Y
Dump Box Yoke **\$5000**



Item B-731 **\$16500**

DRUM and BARREL TILT

A barrel tilt for controlled, precision dumping or pouring. Ideal for chemicals, solvents, powders, etc. Turns 360° through worm drive. Equipped with two safety type locking devices and all steel, welded yoke. Hand-operated chain drive.

When Ordering Always give "Item" number; this will help prevent error. All prices are f. o. b. Detroit. Prices subject to change without notice.
48-3

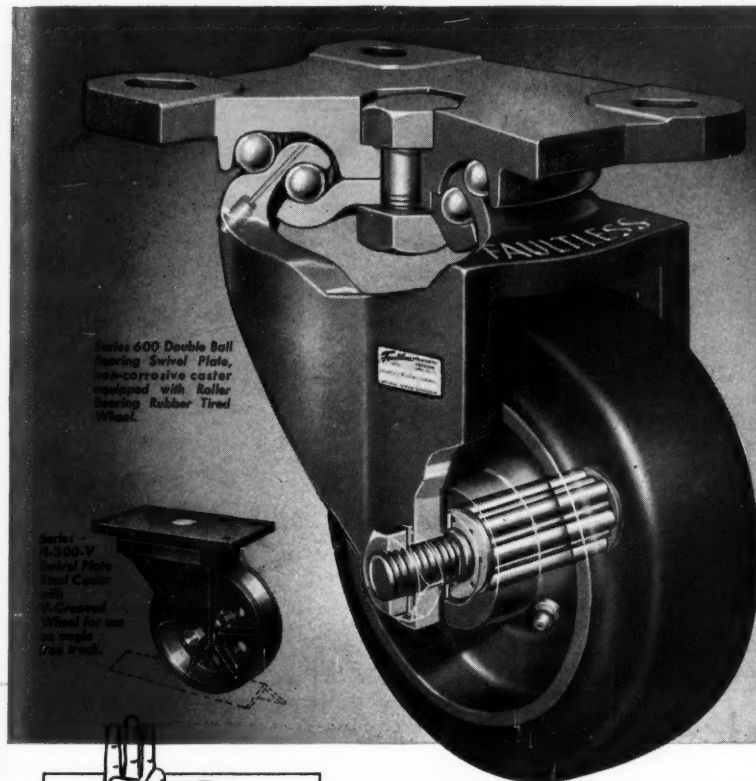
Just out
NEW CATALOG
Send for it today

DESIGNED AND MANUFACTURED BY

Palmer Shile Co.
16012 Fullerton, DETROIT 27, MICH.

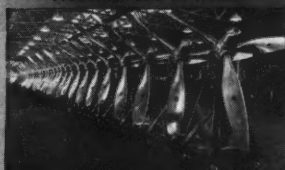
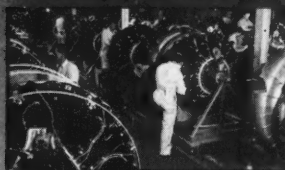
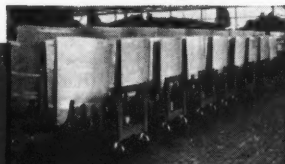
Flexibility

WITH FAST, FLUID PRODUCTION LINES CUTTING HANDLING COSTS



Series 600 Double Ball Bearing Swivel Plate, non-corrosive caster equipped with Rubber Tired Wheel.

Series N-300-V Swivel Plate Castor with V-Grooved Wheel for use on single lead track.



Save costs 3 ways!

1. PRODUCTION:

Higher production costs demand new *short cuts* ... from receiving to shipping platforms. Faultless Casters speed up the flow of materials.

2. MAN-HOURS:

Cutting handling time, accounting for over 20% of industry's man-hours, provides your greatest opportunity for gains in worker productivity—unit output.

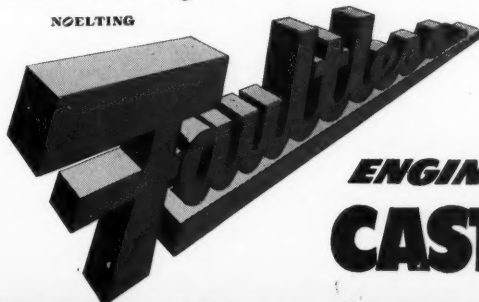
3. FLOORS:

No need for costly floor alterations or floor covering—Faultless wheels are available for all types of floor surfaces and loads.

With world recovery dependent on increased production, no one can tolerate slow-downs due to equipment failures. Hence, the added efficiency and durability of Faultless Casters *engineered* to endure loads and shocks of severe service, gain extra importance. In addition to saving man-hours in the handling of mobile equipment, due to easier performance of Faultless Casters, there's a clear profit from the extra mileage they give.

There is a smooth rolling, easy swiveling Faultless Caster specifically engineered for *your* load, speed and floor requirements. Simply select it from Bulletin 156, or let our nearest sales engineer come in for consultation, no obligation.

NOELTING

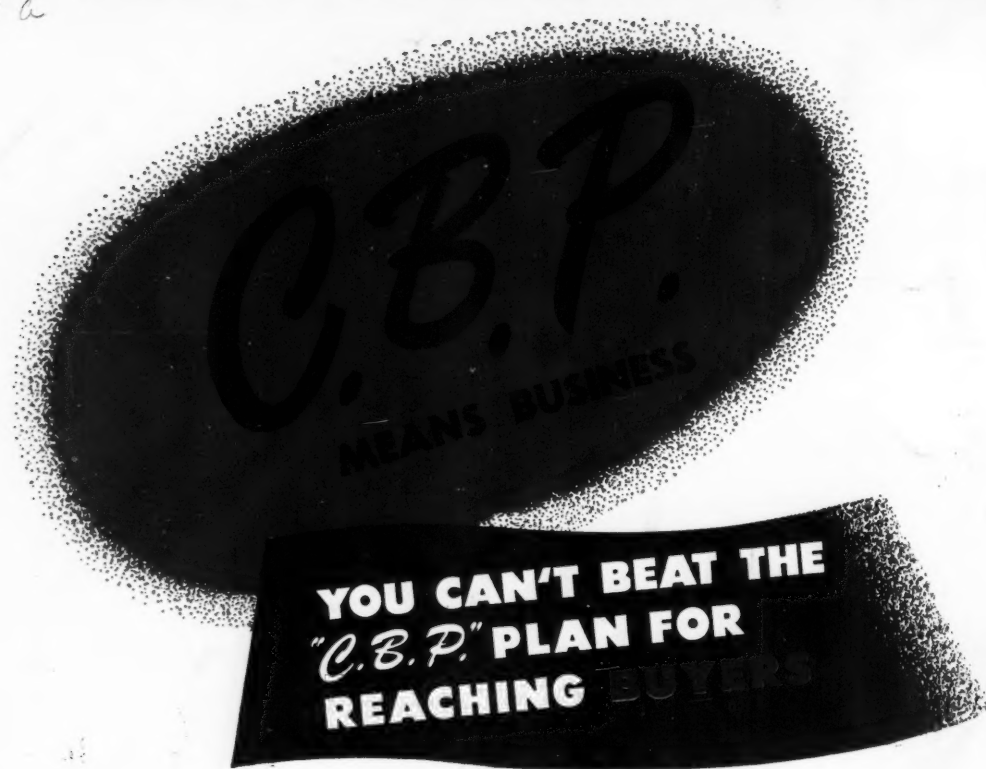


ENGINEERED CASTERS

FAULTLESS CASTER CORPORATION DEPT. F-5, EVANSVILLE 7, IND.

Branches in Atlanta, Boston, Chicago, Dallas, Detroit, High Point, Los Angeles, New York, St. Louis, Canada: Stratford, Ontario

12 a



In the case of FLOW, the C.B.P. Plan (Certified Buying Power) means more than 26,000 readers who are "known" buyers. These individuals are hand-picked from the customer-prospect lists of 43 selected material handling equipment distributors located in 56 key marketing areas. To its CCA guarantee of QUANTITY circulation, FLOW thus adds the C.B.P. QUALITY guarantee of authenticated, "known" reader-buyers. Here is the needed sales link for the advertiser.

Distributors Are Circulation Managers

Each of FLOW'S 43 material handling equipment distributors subscribes to the magazine for his active customers and prospects. The distributor pays us for each subscription. This guarantees that

each FLOW reader is interested in the editorial contents of the magazine, and—equally important—is an active, authenticated buyer of material handling equipment . . . the distributors being the authenticating agent.

FLOW means business. Its more than 26,000 readers are YOUR potential buyers because they are also active, current customers of leading material handling distributors. Here is circulation representing the known national market for material handling equipment . . . a buying audience to whom you must tell your story.

"Certified Buying Power" is a powerful lever which you can use to raise your sales volume.

Other "C. B. P." magazines published by the Industrial Publishing Company are COMMERCIAL REFRIGERATION AND AIR CONDITIONING, for the refrigeration and air conditioning field, INDUSTRY and WELDING, for the welding supply and equipment field, OCCUPATIONAL HAZARDS, for the industrial safety, health and fire protection field, and APPLIED HYDRAULICS for the hydraulic and air circuit engineering field. Send for our booklet: "The 'C. B. P.' Plan . . . A New Dimension Added to Standard Magazine Audits."

Flow MAGAZINE

1240 ONTARIO STREET CLEVELAND 13, OHIO

INDEX TO FLOW ARTICLES

which appeared in 1948

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Candy Processing And Packaging. April, p. 64.

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High-Volume Glass Packing—With

96 MAN HOURS CUT TO 32— WITH BAKER TRUCK

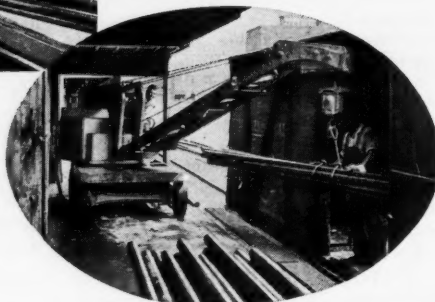
Crane Truck at NATIONAL ACME CO. pays for itself in 8 months



(Above) Boom of Baker Crane truck leaving box car with load of ten 2 3/4" x 20 ft. steel tubes.

(Right) Baker Crane Truck loading tubes onto trailer. Each tube weighs 260 lbs., load weighs 2600 lbs.

This Baker Crane Truck, unloading 20 ft. steel tubes each weighing 260 lbs., cuts man hours by 2/3 over former methods. Actual savings—as shown in tables below—are even greater than estimates made before the truck was purchased:



Man Hours per car — Previous Methods



96 MAN HOURS

Remove blocking from car	0.5 hrs. x 4 men	2.0
Unload to trailer 100,000 lbs.	11.0 hrs. x 4 men	44.0
Clean car	0.5 hrs. x 4 men	2.0
Haul to storage		
Unload from trailer to pile	12.0 hrs. x 4 men	48.0
Return empty trailer		
Total man hours		96.0

Estimated Man Hours with Baker Truck



45 MAN HOURS

Remove blocking from car	1.0 hrs. x 2 men	2.0
Unload to trailer 100,000 lbs.	11.0 hrs. x 2 men	22.0
Clean car	1.0 hrs. x 2 men	2.0
Haul to storage		
Unload from trailer to pile	9.5 hrs. x 2 men	19.0
Return empty trailer		
Total man hours		45.0

Actual Man Hours with Baker Truck



32 MAN HOURS

Remove blocking from car	0.5 hrs. x 2 men	1.0
Unload to trailer 100,000 lbs.	7.0 hrs. x 2 men	14.0
Clean car	0.5 hrs. x 2 men	1.0
Haul to storage		
Unload from trailer to pile	8.0 hrs. x 2 men	16.0
Return empty trailer		
Total man hours		32.0

A Baker Material Handling Engineer can show you how to make similar savings

BAKER INDUSTRIAL TRUCK DIVISION
of The Baker-Raulang Co.
1219 WEST 80th ST. CLEVELAND, OHIO
In Canada: Railway & Power Engineering Corporation, Ltd.

Baker INDUSTRIAL TRUCKS

Care. June, p. 54.
Prepackaging Tomatoes In Trays. June, p. 59.

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Charging 60-Ft.-High Tanks—Safely And Economically. May, p. 64.

RUBBISH REMOVAL

G.E.'s General Rubbish Handling Program. April, p. 38.

SAFETY STANDARDS

Safety Standards For Cranes And Hoists. April, p. 50.

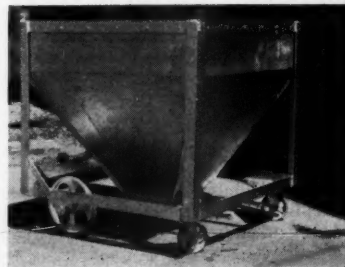
SCRAP HANDLING

Scrap Conveyor In A Sheet Steel Mill. May, p. 20.

SHEET STEEL HANDLING

One Sheet At A Time—The Costly Way. April, p. 34.

KEEPING PEAS GREEN—The handling of fresh peas from the vine to the cannery is often a problem for the food processor. The vegetable is highly perishable and must be canned or processed in minimum time to maintain color and freshness. Formerly the product was handled in small boxes which were hand stacked on the truck. The Rock Valley Canning Co., Belvidere, Ill., has installed this new mobile hopper, which is loaded at the vineyard and trucked to the canning plant. A special elevator for use at the vineyard was also designed. The hopper is constructed of heavy steel on wide steel channels, with a square, funnel-shaped hopper mounted on four wheels, two of which are swiveled. Peas in the field are spouted into the hopper, and, when filled, the unit is rolled onto an elevator which lifts it up to the level of waiting trucks for quick transport to the cannery. At the latter, the hoppers are moved over a drop door leading to conveyor belts. A pin at the bottom of the hopper is pulled and the sliding bottom moved out, discharging the load to the belt for quick processing. Waterproof canvas covers are provided for each load hopper to protect the peas from sun, rain and dust enroute.—Courtesy, West Bend Equipment Corp.



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